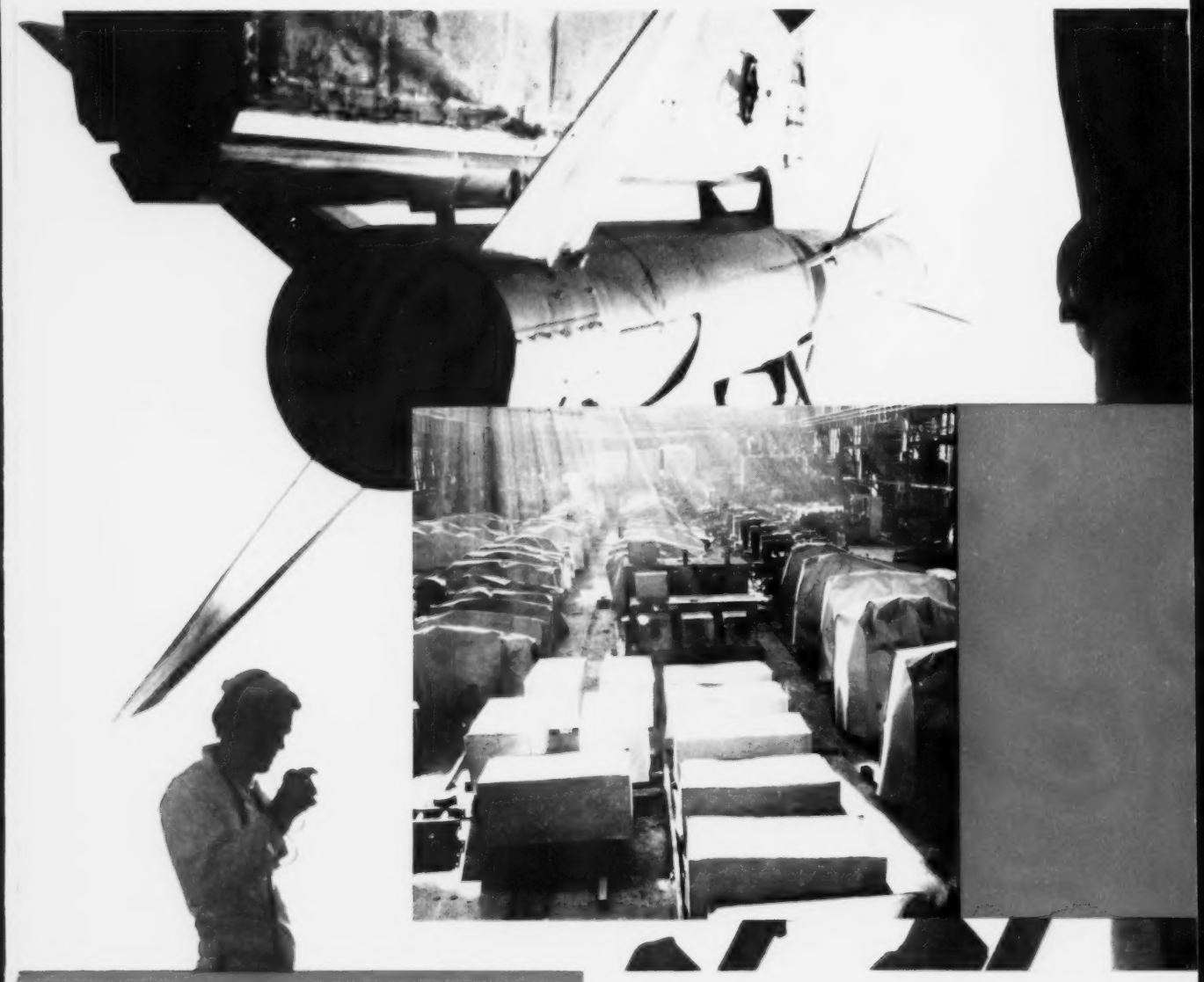
The IRON AGE

November 21, 1957 A Chilton Publication The National Metalworking Weekly



How Missiles Will Change Defense Buying P. 81

Tips on Selling In Venezuelan Market – P. 86

New Way to Choose Wear-Resistant Metals – P. 121

Digest of the Week P. 2-3

THE OTHER TURN

JOE'S HAVIN' A TOUGH TIME EXPLAININ' THAT ONE TO THE OLD MAN.
HE SHOULD OF PUT TRUNIONS ON IT AND BRICKED IT UP AS A NEW LADLE.
WHEN HE TAPPED THAT ONE IT WAS COLD ENOUGH TO PUT THE LIGHTS OUT.
DONALD STANTON, SENIOR PRACTICE MAN ALGOMA STEEL CORP., LTD. SAULT STE. MARIE, ONTARIO
HUEKES

The Big Alibi

WHY NOT DESCRIBE YOUR OPEN-HEARTH CARTOON IDEA AND SEND IT ALONG TO US?

The benefits steelmakers obtain from our refractories are in part a result of Basic's on-the-job servicing. One of the rewards of this close relationship has been the opportunity to observe and appreciate the lighter side of these usually serious craftsmen.

BASIC INCORPORATED 845 HANNA BUILDING • CLEVELAND 15, OHIO

CALL BETHLEHEM FOR FLANGED-AND-DISHED HEADS—Bethlehem makes flanged-and-dished heads to meet virtually every requirement. Types furnished include ASME Code, standard and elliptical flanged-and-dished, flanged-only, dished-only, shallow-dished, tank-car, obround and double-dished. Diameters: up to 144 in.; thicknesses: 14 gage to 2½ in. Bethlehem also produces standard manhole and handhole saddles, covers and fittings. We also furnish heads with flued openings. If you would like to have complete information about the flanged-and-dished heads that are manufactured by Bethlehem just write or phone the nearest Bethlehem sales office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

THE IRON AGE
Chestnut and 56th Sts.
Philadelphia 39, Pa.
SHerwood 8-2000

GEORGE T. HOOK, Publisher

EDITORIAL STAFF

TOM C. CAMPBELL, Editor-in-Chief
GEORGE F. SULLIVAN, Editor

Managing Editor — E. C. Beaudet
News-Markets Editor — J. B. Delaney
Asst. News Mkts. Ed. — R. D. Raddant
Technical Editor — J. J. Obrzut
Machinery Editor — E. J. Egan, Jr.
Metallurgical Editor — P. M. Unterweiser
Materials Editor — Wm. Czygan
Engineering Editor — R. H. Eshelman
Art Director — J. A. Degen
Associate Editors: F. J. Starin, P. J. Cathey, R. Schulin, F. P. Plimpton.
Assistant Editor: J. A. Moore. Regional Editors: K. W. Bennett, Chicago; T. M. Rohan, Cleveland; H. R. Neal, Detroit; G. G. Carr, New York; R. R. Kay, Los Angeles; G. J. McManus, Pittsburgh; G. H. Baker, R. M. Stroune, N. R. Regelmbal, Washington. Correspondents: F. L. Allen, Birmingham; N. Levenson, Boston; R. M. Edmonds, St. Louis; J. Miller, San Francisco; R. Kazarian, Buffalo; D. A. Coughlin, Seattle; F. Sanderson, Toronto; F. H. Harley, London, England; Chilton Editorial Board: Paul Wooton, Washington representative.

WASHINGTON EDITORIAL OFFICE
Washington 4 — National Press Bldg.

BUSINESS STAFF

Production Manager — Warren Owens
Director of Research — Oliver Johnson
Circulation Mgr. — W. M. Coffey
Promotion Manager — Richard Gibson
Asst. Research Dir. — Wm. Laimbeer

REGIONAL BUSINESS MANAGERS

Chicago 1 — T. H. Barry, W. R. Pankow, 360 N. Michigan Ave. — Randolph 6-2166
Cleveland 15 — Robert W. Watts, 930 B. F. Keith Bldg. — Superior 1-2860
Columbus 15, Ohio — Harry G. Mumm, LeVeque-Lincoln Tower — Capital 1-3764
Detroit 2 — W. J. Mulder, 103 Pallister Ave. — Trinity 1-3120
Los Angeles 28 — R. Raymond Kay, 2420 Cheremoya Ave. — Holly'd 3-1882
New York 17 — C. H. Ober, C. T. Post, I. E. Hand, 100 E. 42nd St. — Ost'd 7-3400
Philadelphia, B. L. Herman, J. A. Crites, 56th & Chestnut Sts. — Sherwood 8-2000
Pittsburgh 22 — T. M. Fallon, 1502 Park Bldg. — Atlantic 1-1832
San Francisco 3 — Don May, 1355 Market St. — Underhill 1-9737
Tulsa — H. E. Mott, J. W. Sangston, 621 Petroleum Bldg. — Luther 4-1769
W. Hartford 7 — Paul Bachman, 62 LaSalle Rd. — Adams 2-0486
England — Harry Becker, 15 Gratton St., Altrincham, Cheshire

One of the Publications Owned and Published by Chilton Company, Chestnut & 56th Sts., Philadelphia 39, Pa.

OFFICERS AND DIRECTORS

Joseph S. Hildreth, Ch. of the Board
G. C. Busby, President

Vice-Presidents: P. M. Fahrendorf, Harry V. Duffy, George T. Hook, Robert E. McKenna, Leonard V. Rowlands; Treasurer, William H. Vallar; Secretary, John Blair Moffett; Directors: Maurice E. Cox, Frank P. Tighe, Everit B. Terhune, Jr., Russell W. Case, Jr., John C. Hildreth, Jr.—Comptroller, Stanley Appleby.

Indexed in the Industrial Arts Index and the Engineering Index.

BPA NBP

Copyright 1957 by Chilton Company

THE IRON AGE, published every Thursday by CHILTON COMPANY, Chestnut & 56th Sts., Philadelphia 39, Pa. Entered as second class matter, Nov. 8, 1932, at the Post Office at Philadelphia under the Act of March 3, 1879. Price to the metal working industries only or to people actively engaged therein, $5 for 1 year; $8 for 2 years in the United States, its territories and Canada. All others $15 for 1 year; other Western Hemisphere countries, $15; other Foreign Countries, $25 per year. Single Copies, 50¢. Annual Review Issue, $2.00. Cable: "Ironage" N. Y.

The IRON AGE

November 21, 1957—Vol. 180, No. 21

Digest of the Week in

*Starred items are digested at right.

EDITORIAL

Short Term Jitters: Let's Get Them Over With 7

NEWS OF INDUSTRY

*Special Report: How Hard Will Missile Spending Hit Industry? 81
*Educators React to Ike's Appeal 84
*New Mill to Roll Superalloys 85
*Building a Market in Venezuela 86
*Steel Mills Use More Hot Metal 88
*Imports Hit Oil Country Market 90
The IRON AGE Salutes 95
Men in Metalworking 111

FEATURE ARTICLES

*Selecting Wear-Resistant Materials 121
*Remedy for Drawn Shell Defects 125
*What to Do About Metal Fires 128
*Strength for Iron Ore Pellets 130
Gage Tightens Wire Coating Control 132
*Copper Base Alloy Vies with Ni-Ag 134

NEWS ANALYSIS

Newsfront 79
Report to Management 97
*Automotive 98
*Washington 103
*West Coast 105
*Machine Tool 107

MARKETS & PRICES

*The IRON AGE Summary 179
*Purchasing 180
Steel Product Markets 182
Index to Prices 183
Iron and Steel Scrap Markets 184
Nonferrous Markets 188
Clearing House 200

REGULAR DEPARTMENTS

Letters 9
Fatigue Cracks 11
Exhibits, Meetings 13
Free Literature 138
Technical Briefs 148
New Equipment 168

INDEX TO ADVERTISERS 208

NEWS ARTICLES

TECH EDUCATION

Response to Ike's Appeal—Science educators are applauding the President's call for more funds and improved teaching methods. An IRON AGE survey shows educators agree on four major points. P. 84

LATIN AMERICA

Its Market Potential—Building a market in South America can be a profitable venture if you go about it the right way. Probably none of these nations respects, needs, and welcomes American business people more than Venezuela. P. 86

HOT METAL

More Pig Iron—High blast furnace operating rate points up the trend to use of more hot metal and less scrap in steelmaking. J&L president Adams says his company is using 78 pct hot metal. P. 88

AUTO SECRETS

How Ford Guards Them—Protecting new designs from the prying eyes of competitors is a serious business in Detroit. Ford uses up-to-date cloak-and-dagger tactics at its new Dearborn styling center. P. 98

MISSILE PROBE

Ready to Begin — The Senate's investigation into the U. S. rocket-satellite program will start Nov. 25. Senator Johnson hopes to learn why

Metalworking

OLD OR NEW?

Will missiles totally replace the strategic stockpiling policy now the basis of U. S. mobilization strength? The question is a big one among defense industries today. Its answer will greatly affect future defense spending. P. 81

the U. S. lags and what can be done to regain the lead. Steel price probe is moved back. P. 103

ELECTRONIC CONTROLS

Maintenance Is Vital—Electronic machine tool controls are finding new uses almost every day. But circuits can go out of adjustment or fail completely. Good maintenance will help keep these at a minimum. P. 107

FEATURE ARTICLES

WEAR-RESISTANT MATERIALS

How to Select—You can make your choice through trial-and-error methods. But wrong guesses are costly. A new way to select wear-resistant materials stresses two points: Classifiy wear conditions. Then check to see what others have done. The choice depends on whether the material can carry the load. P. 121

DRAWING SHELLS

How to Remedy Defects—The first time a new die is used, it's a bet that troubles will crop up. Eight types of defects are most apt to occur. They range from minor wrinkles to bad tears. P. 125

METAL FIRES

A Growing Menace—Some metals ignite even on exposure to air, and they react violently to most types of extinguishing agents. The list includes magnesium, liquid sodium, and potassium. Proper safeguards will help prevent such fires, but it takes a new approach to fight the fire once it starts. P. 128

IRON ORE PELLETS

Low-Cost Production — A new method for pelletizing and heat treating makes low-grade magnetite ore economical for steel mills. By efficient reuse of exhaust gases, the continuous cycle gets lower fuel and maintenance costs. P. 130

COPPER-BASE ALLOYS

Compare With Nickel Silver—With the present low supply of nickel, it takes ingenuity to find suitable substitutes. Copper-base alloys, modified with zinc or aluminum, can do the job of 18 pct nickel silver at temperatures up to 1000°F. P. 134

MARKETS & PRICES

IMPORT TROUBLES

Hit Oil Country—Imports from Italy and Canada undersell U. S. producers of oil country goods. Japan shows signs of getting into the act. Long-range outlook is bright. P. 90

SUPERALLOY MILL

Developed by Latrobe—New 32-in. cogging mill at Latrobe Steel Co. was built to handle high-speed steels and difficult-to-work superalloys. Among innovations are diamond-grooved rolls rather than the usual box or flat rolls. P. 85

SAN FRANCISCO

Holds Its Own—A well-balanced electronics industry is helping keep the Bay Area busy. About 90 pct of metalworking there is non-defense, so defense cutbacks have had comparatively little effect. P. 105

STEEL ORDERS DROP

Backlogs Falling—Incoming orders are a disappointment to steel producers. As a result, backlogs are dropping. And there's no immediate prospects of a reversal of the downtrend. P. 179

SHOP EQUIPMENT

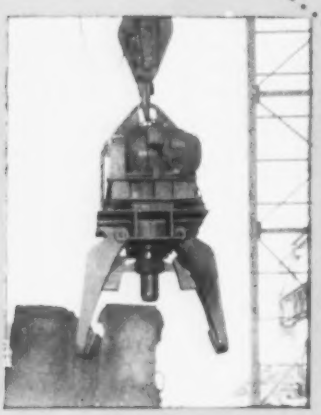
Market Strong — Manufacturers of shelving, benches, cabinets, and tool tenders enjoy good business. However, market is competitive enough to give users good selection of products and fast delivery P. 180

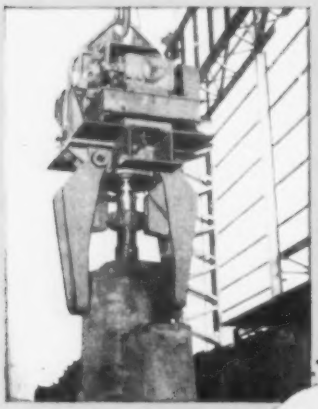
NEXT WEEK

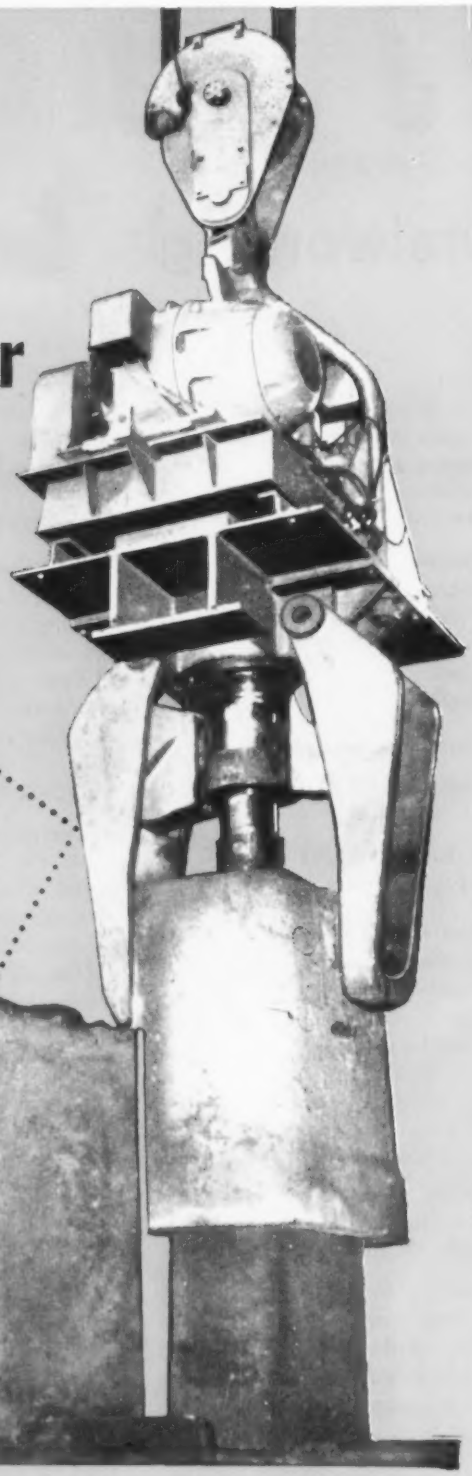
U. S. A., INCORPORATED

Too Far in Business?—Rep. C. J. Brown (R-Ohio), often called "father of the Hoover Commission," calls a spade a spade in his criticism of federal invasion of private enterprise. Next week, he tells the inside story of U. S. in business.

450 TON
portable ingot stripper
in action







Our newly designed 450 ton Portable Ingot Stripper may be used every day of the year or on a stand-by basis.

Write today for our illustrated brochure and complete information.

"Electric and Open Hearth Steel Castings from 1 lb. to 100 tons"

Pittsburgh
ENGINEERING
& MACHINE CO.
Division of Pittsburgh Steel Foundry Corporation

P. O. BOX 986,
PITTSBURGH 30, PENNSYLVANIA
PLANT AT
GLASSPORT, PENNSYLVANIA

OSBORN®

BEFORE BRUSHING—*Jet engine parts formerly hand-filed and emery-rubbed to remove burrs and sharp edges.* Hand-finishing time: 80 minutes.

AFTER BRUSHING—*Burrs are thoroughly removed, edges and surface junctures are blended to radius tolerances . . . each part is precision-finished quickly, uniformly.* Osborn Brushamatic® finishing time: 8 minutes.

Flying finish for jet engine parts

...10 times as fast with precision OSBORN Brushamatic® Methods

JET ENGINE COMPONENTS *are precision finished automatically at high production rates on Osborn Brushamatic® 51-OOL Machine.*

HERE'S how a jet engine manufacturer has broken a production bottleneck . . . saved dollars and days in the precision-finishing of jet engine components . . . with Osborn Brushamatic® Methods.

Sharp edges, burrs or scratches on components cause stress concentrations and resulting fractures—so a high degree of surface refinement is essential. *Tedious hand finishing each of these parts used to take 80 minutes.* Still, job quality was inconsistent . . . costly in time and money.

Today, Osborn Brushamatic does the same job in 8 minutes . . . 10 times as fast . . . with a high-quality, uniform finish held to micro-inch specifications.

It's typical of how Osborn Power Brushing works to help *you* speed production . . . cut costs . . . improve product quality. An **O**sborn **B**rushing **A**nalysis, made in your plant at no obligation, will show you how. Write us for details—and for your copy of the 20-page Brushamatic® booklet. *The Osborn Manufacturing Company, Dept. F-63, Cleveland 14, Ohio.*

Osborn Brushes®

BRUSHING MACHINES • BRUSHING METHODS • POWER, PAINT AND MAINTENANCE BRUSHES • FOUNDRY PRODUCTION MACHINERY

Big Squeeze Doesn't Flake Zinc Coating on Armco ZINCGRIP Tubing

Any product or part made from steel tubing can be made from zinc-coated Armco ZINCGRIP® Steel Tubing, *with no loss of zinc protection during fabrication.* Here's proof:

With a powerful squeeze in a machine, a six-inch length of ZINCGRIP Tubing folded like an accordion into a one-inch section. The steel didn't crack. *And there was no evidence of flaking or peeling of the tight zinc coating, at the weld or anywhere else.*

You can be sure this special zinc coating will hold just as tightly on any tubular products *you* fabricate. This means your finished products will be protected against corrosion without painting. Other special coated Armco Tubing grades also offer protection against corrosion.

Two Aluminum-Coated Grades

Armco ALUMINIZED STEEL® Type 1 Tubing (hot-dip aluminum-coated) is made from a special steel created to withstand combinations of heat and corrosion. For tubular products in outdoor service, Armco ALUMINIZED STEEL Type 2 Tubing offers resistance to atmospheric corrosion.

Take advantage of the high strength and light weight of corrosion-protected Armco Welded Steel Tubing in products or parts *you* make.

For complete information, just call your nearby Armco Sales Office or fill in and mail the coupon.

ARMCO STEEL CORPORATION
1337 Curtis Street, Middletown, Ohio
SEND DATA ON:
☐ **Armco ZINCGRIP Tubing**
Other _____

Name _____

Firm _____

Street _____

City _____ Zone ____ State _____

ARMCO®

ARMCO STEEL CORPORATION

1337 CURTIS STREET, MIDDLETOWN, OHIO

SHEFFIELD STEEL DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION

Short Term Jitters: Let's Get Them Over With!

Now that Mr. Martin and the Federal Reserve Board have thrown in the sponge, reduced the discount rate, and quit leaning against a wind that wasn't there, we shall see what part restored confidence plays in our short-term panic. Their action was welcome. Whether it came in time to cure the jitters of some business people, who should have been made of sterner stuff, remains to be seen. We think it did come in time.

Now that President Eisenhower has said publicly what every high school student knows—or should know—about defense, that area of jitters should be on its way to being quenched. But the cure won't come with mere words; it will come with achievement and specific contracts. These cost money—more than is being whispered about in high places. But we are on our way.

What about business even if these two big psychological events had not taken place? Was a downtrend coming despite hell and high water? Were we—or are we—in for a dip that will rival 1954? Do we face a deep depression as indicated by some business school professors?

People are funny. And this goes for the high as well as the low on the organization chart. Basic facts and simple interpretation indicate that we do not face a serious recession. Now that the FRB discount rate is down and it is our policy to spend more for defense, it ought to be clear that our crying towels may be put away.

The momentum generated by the panic in the stock market, by the postponement of some new plant and equipment buying, and by the downturn in durable goods output may continue for some months. But even without the confidence-bolstering moves of the government and FRB, we would have had a recovery with a dynamic upswing sometime late in 1958 or early in 1959. Between now and then the reversals will not be severe enough to affect earnings seriously, to cause wholesale unemployment or to build a basis for a 1932-type crash.

Before the next 12 months are out there will be many business people who will be sorry they did not place that order for new plant and equipment, that they did not carry bigger inventories, that they didn't hire that high priced but intelligent engineer or secretary, and that they didn't plan for progress instead of retrenchment.

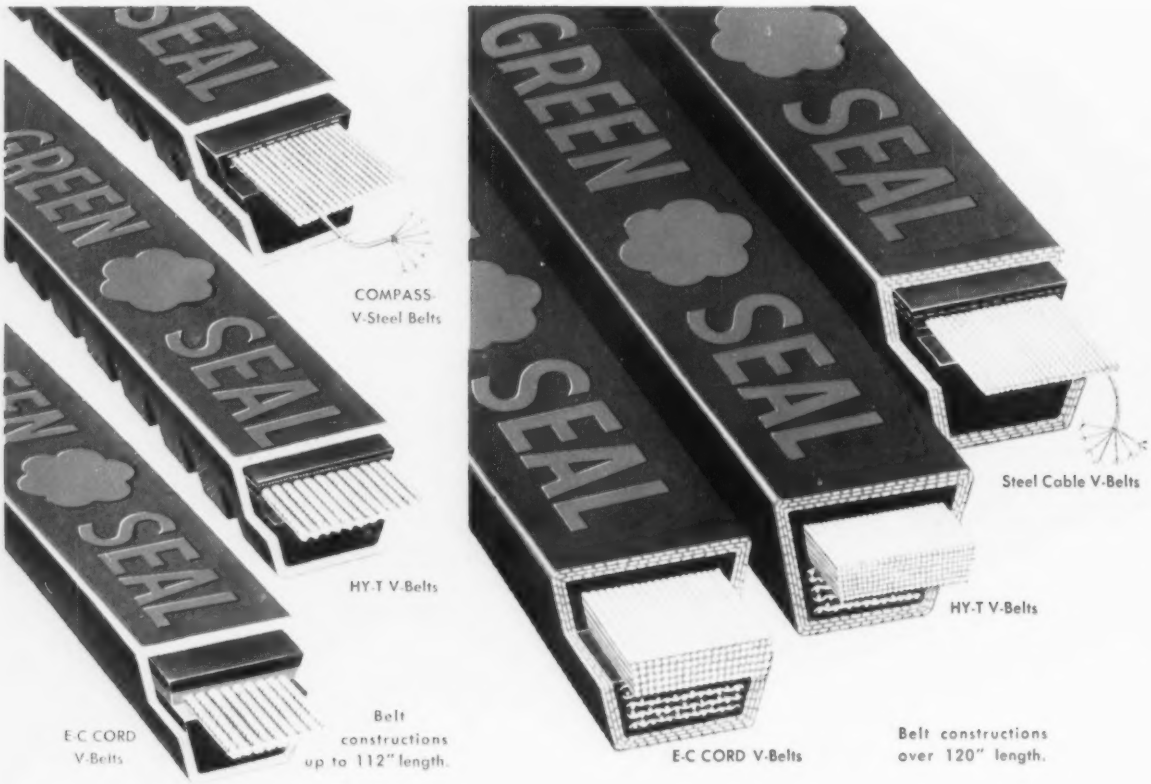
Ditch the short term jitters; they are costing you money, prestige—and progress.

Tom Campbell

Editor-in-Chief

Do you know the inside story of

V-Belts with the Green Seal?



Until recently dimensional stability was possible only in V-Belts with steel load-carriers as developed by Goodyear. But now you can have that stability in a complete line of belts – thanks to the development of Triple-Tempered (3-T) cord–synthetic cord tempered by Tension, Temperature and Time.

What's your pay-off from this dimensional stability?

When you're belting multiple drives, it's your one guarantee that every set of matched belts will *really* match. No matter how long you store them, they'll *stay* matched, too.

And once they're installed, you've got belts designed and built to work as a perfect team–without individual belts either "loafing" or overworking. In fact, you're protected from all the usual mismatching headaches that also include slipping, stretching, scorching.

In other words, you're belted for maximum trouble-free horsepower hours at minimum cost. There's no substitute for that kind of performance – or for the V-Belts with the Green Seal that give it to you – every time.

So see your dealer about the V-Belts with true dimensional stability–the V-Belts with the Green Seal. Or write Goodyear, Industrial Products Division, Lincoln 2, Nebraska, or Akron 16, Ohio.

DIMENSIONALLY STABLE V-BELTS
with the GREEN SEAL by

GOODYEAR

THE GREATEST NAME IN RUBBER

Compass, E-C Cord, Hy-T, Green Seal–T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

Watch "Goodyear Theater" on TV – every other Monday 9:30 P.M. E.S.T.

LETTERS FROM READERS

The Enemy Within

Sir — I admire your editorials, especially "Alibis Are No Excuse, We Are Losing the Cold War," in the Oct. 10 issue. But I am disappointed that some of your editorials do not point out that the Communists are not the only enemies of human liberty.

What about the political opportunists who are helping the "Daily Worker" sell Communism by using the words "big business" as a swear word?

Flag Wavers—What about the guileful political leaders and organizations who are waving anti-Communist banners, while they are using their influence on the selfish, the prejudiced, and the short-sighted citizen, to promote a socialistic regime in which they and their intimate friends would hold the reins of government?—S. Malewaga, Big Lake, Minn.

▪ We agree about the danger of enemies from within and have often published editorials along this line. —Ed.

Business As Usual

Sir—Congratulations on your fine editorial in the Oct. 31 issue, "Business As Usual? Hardly, For Quite Some Time."—F. C. Preussler, Wauwatosa, Wis.

Sales Forecasting

Sir—Congratulations on publishing the Sandmaier articles on Sales Forecasting. It is the best succinct statement of the subject that I have read.

I have accepted an invitation from the American Management Assn. to be chairman of a seminar on sales forecasting which will be held early in December and again in the middle of January in New York.

I would like your permission to distribute copies of the Sandmaier article to executives attending each seminar. — N. R. Kidder, Pres., Kidder and Co., Cambridge, Mass.

▪ Permission granted.—Ed.

Sir—I read with great interest your Oct. 31 article about sales forecasting for smaller firms by Mr. P. J. Sandmaier of Republic Steel.

Your magazine always gives a wealth of factual and current information about industry which is most useful to me in my own field of business.—J. V. Donoghue, A. G. Becker & Co., Inc., Chicago.

Pull Up Your Socks

Sir—May we congratulate you on the IRON AGE editorial entitled "Pull Up Your Socks, It May Get a Little Sloppy!"

That is one of the best editorials I have read in quite some time and I am wondering if you would be good enough to send us about 25 to 30 copies.—T. A. Warner, Sales Mgr., Hendrick Mfg. Co., Carbondale, Pa.

▪ Copies are on the way.—Ed.

"When we say our cartons are scientifically sealed, we really mean it."

Temper, Temper!

Somers

can control it

If the temper of thinstrip used in your present production is getting your temper up, Somers will be glad to show you how closely it can be controlled.

Whatever your problems with thin gauge brass, nickel, copper and alloys, from .0001" to .010", Somers has the modern equipment, complete laboratory facilities and nearly 50 years of experience ready to help you solve them without cost or obligation.

Write for Confidential Data Blank.

Somers THIN STRIP

Somers Brass Company, Inc.

102 BALDWIN AVE. WATERBURY, CONN.

NEW

THE ACCURATE A. D. M.® STEEL RULE MALE and FEMALE DIE

MALE & FEMALE DIES

FOR METAL STAMPING

- Steel and Similar Metals up to .140 in Thickness
- Aluminum and Similar Metals up to .202 in Thickness

COST

Only a fraction of the cost of conventional Male & Female Dies. The larger the die the greater the proportionate savings.

Come complete with line-up pins ready to attach to your die set.

DELIVERY FROM 2 TO 5 DAYS

BREAK YOUR DIE BOTTLE NECK
SOLVE YOUR DIE MAKER SHORTAGE

An Accurate ADM "Steel Rule" Male & Female Die Is Your Best Buy

ALL QUOTATIONS ANSWERED THE SAME DAY WE RECEIVE THEM

MINIMUM PRODUCTION ON STEEL AND SIMILAR METALS

THICKNESS	MINIMUM	MAXIMUM
1 32 STEEL	100,000	UNKNOWN
1 16 STEEL	100,000	UNKNOWN
3 32 STEEL	75,000	UNKNOWN
1 8 STEEL	50,000	UNKNOWN

MAXIMUM UNKNOWN AS DIES HAVE NEVER BEEN RUN TO DESTRUCTION

MINIMUM PRODUCTION ON ALUMINUM AND SIMILAR METALS

THICKNESS	MINIMUM	MAXIMUM
1 16 ALUMINUM	125,000	UNKNOWN
3 32 ALUMINUM	100,000	UNKNOWN
1 8 ALUMINUM	75,000	UNKNOWN
5 32 ALUMINUM	50,000	UNKNOWN
3 16 ALUMINUM	40,000	UNKNOWN

MAXIMUM UNKNOWN AS DIES HAVE NEVER BEEN RUN TO DESTRUCTION

The Best Buy is an Accurate Die

ACCURATE©

STEEL RULE DIE MANUFACTURERS

22-24 West 21st Street, New York 10, N. Y. • CH 2-0860-1-2

OVER A QUARTER OF A CENTURY OF DIE MAKING SERVICE TO INDUSTRY

South American Way

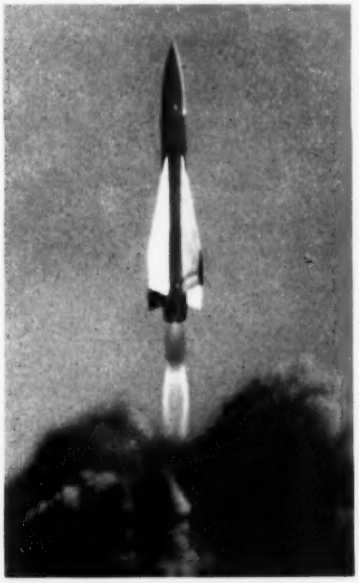
Tom Campbell, our editor-in-chief, is just back from a trip to South America—specifically, Venezuela. While there he talked with Venezuelans in business and government, to Americans who work and live in this great South American country.

Tom renewed some old friendships, too. Friends who remembered him from 1950 when he wrote an on-the-spot story on U. S. Steel's Cerro Bolivar iron ore project.

You'll find the results of Tom's return visit on page 86. It's a real practical guidebook on how to do business in Venezuela and other South American countries.

Changing Pattern

The warning flags are flying. Changes in the pattern of defense buying are in the making. So this



Army Hawk takes off.

is as good a time as any to take stock. If you're not keeping close tab on what missiles and earth satellites could mean to your business, you're missing a bet.

That's why our editors have been spending so much time buttonholing military people and others who know what's going on. Right now there's a struggle going on between those who favor the "forces in being" concept of defense and those who believe strategic stockpiling is the answer.

Whichever of these two groups prevails will have a bearing on how the military goes about preparing our defenses. And this in turn will affect defense buying.

For a real closeup of what's going on in Washington and elsewhere, turn to our special report on the changing pattern of defense spending, beginning on page 81.

Puzzlers

Remember the chipmunk who sat on a log 10 ft long and 3 ft in circumference and the log rolls down the hill for 50 ft and the chipmunk runs from one end of the log to the other always remaining on top and you were to figure out how far he travelled by the time the log reached the foot of the hill? Remember?

Well, he travelled along the hypotenuse of a right triangle whose sides were 50 feet by 10 feet—50 99/100 feet.

—and the winners: Jim Mull, The North American Manufacturing, Cleveland; Ed Moore, Ford Motor Co., Detroit, and Lee E. Holcomb, Crawford & Doherty Foundry Co. And the losers, some said just plain 50 feet: Thomas N. Grant, Jr., American Steel & Wire Div., Donora, Pa.; Charlsie, G.S.C.C., Granite City, Ill., R.E.R.D., United States Steel; Bill Bayer, HPM Div. of Korehring Co., Mt. Gilead, Ohio; Everett V. Angell, Red Seal Metals, South Gate, Calif.; and R. R. Shields, Walworth Co., Greensburg, Pa.

DEFIES HEAT
ABRASION...
FATIGUE...
LEAKS
FLEXIBLE TUBING FOR THE STEEL INDUSTRY
High temperatures and pressures? Exposure to crushing, abrasion, expansion, contraction? Name your operating conditions for air, water, steam lines, for conveying volatiles, gases, chemicals, powder, granular and semi-solid materials. Penflex can meet them with flexible bronze, galvanized and stainless steel corrugated and interlocked tubing. All types, all sizes. 1/8" to 24" I. D. Ask for booklet. Pennsylvania Flexible Metallic Tubing Company, Inc., 7210 Powers Lane, Phila. 42.
PENFLEX
TIGHT AS A PIPE BUT...
FLEXIBLE

EXHIBITS, MEETINGS

Have you tried J&L's superior quality

JALZINC*

*Registration applied for.

JALZINC is Jones & Laughlin's new trade name for its *high quality* zinc coated steel sheet and coiled product. JALZINC answers your toughest forming, rolling and drawing problems.

Produced by the proven Sendzimir process, JALZINC has a tight, uniform coating that resists cracking and flaking. The high lustre finish greatly improves the appearance of your end product. JALZINC is available in a wide range of gages and widths in both cut lengths and coils.

Users are enthusiastic about JALZINC'S uniform ductility, flatness and surface finish. Write today for complete details.

J&L inspector examines a roll of 18 gage JALZINC as it is coiled on a reel of the new Sendzimir continuous line.

Jones & Laughlin Steel Corporation
3 Gateway Center, Pittsburgh 30, Pa.

- ☐ Please send literature on JALZINC
- ☐ Please have J&L representative call

Name

Position

Company

Address

City Zone

State

J&L STEEL

Jones & Laughlin

STEEL CORPORATION · PITTSBURGH

EXHIBITS, MEETINGS

Exposition of Chemical Industries—Dec. 2-6, New York Coliseum. (International Exposition Co., 480 Lexington Ave., N. Y. 17.)

Third Annual National Construction Industry Conference on Creative Trends in Structural Design—Dec. 4-5, Congress Hotel, Chicago. (Armour Research Foundation of Illinois Institute of Technology, 10 W. 35th St., Chicago 16.)

Plant Management and Engineering Show—Jan. 27-30, 1958, International Amphitheatre, Chicago.

NOVEMBER

Manufacturing Chemists' Assn.—Semi-annual meeting and winter conference, Nov. 26, Hotel Statler, New York. Society headquarters, 1625 Eye St., N. W., Washington 6, D. C.

DECEMBER

American Society of Mechanical Engineers—Annual meeting, Dec. 1-6, Statler Hotel, New York. Society headquarters, 29 W. 39th St., New York 18.

Electric Overhead Crane Institute—Annual meeting, Dec. 3, Statler Hotel, Washington, D. C. Society headquarters, One Thomas Circle, Washington 5, D. C.

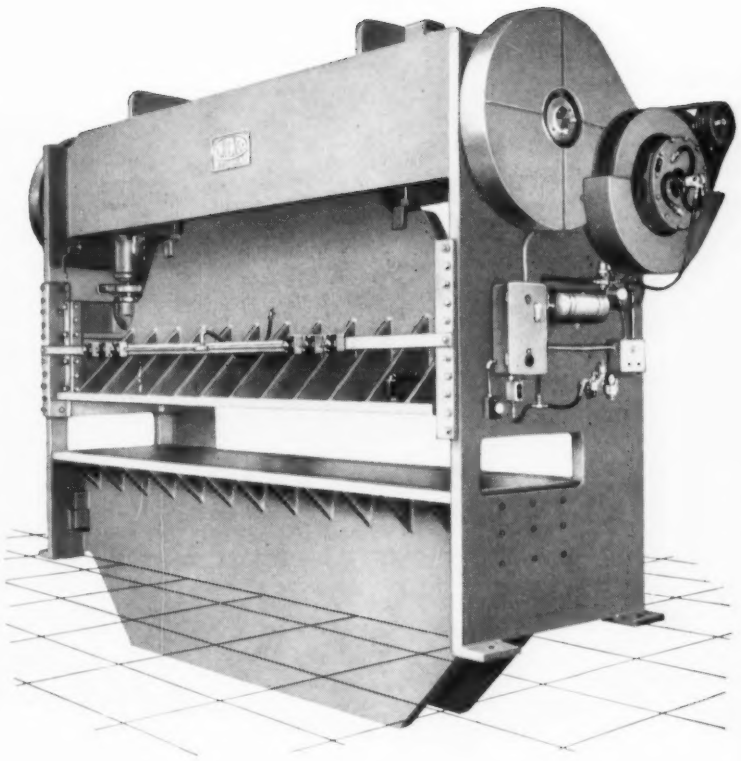
American Institute of Mining, Metallurgical, and Petroleum Engineers—Fifteenth annual conference on electric furnace steel, Dec. 4-6, Penn-Sheraton Hotel, Pittsburgh. Society headquarters, 29 West 39th St., New York 18.

National Assn. of Manufacturers—Annual meeting, Dec. 5-7, Waldorf-Astoria, New York. Society headquarters, Two East 48th St., New York.

American Institute of Chemical Engineers—Annual meeting, Dec. 8-11, Conrad Hilton Hotel, Chicago. Society headquarters, 25 W. 45th St., New York.

IRE, ACM, AIEE—1957 Eastern

(Continued on P. 16)



CHICAGO DREIS & KRUMP

PRESSES

STRAIGHT-SIDE TYPE

large die area

capacities up to 400 tons

This is a typical model of CHICAGO straight-side-type presses used for multiple punching, notching, and trimming operations. This press with a die area of 48 inches by 198 inches has a capacity of 200 tons.

Complete recommendations for any job on request.

6674

CHICAGO DREIS & KRUMP

Press Brakes • Straight-Side-Type Presses • Press Brake Dies

Hand and Power Bending Brakes • Special Metal-Forming Machines

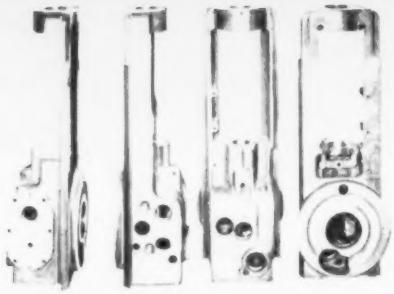
DREIS & KRUMP MANUFACTURING CO.

7430 South Loomis Boulevard, Chicago 36, Illinois

Tool slides precision with BURGMASTER

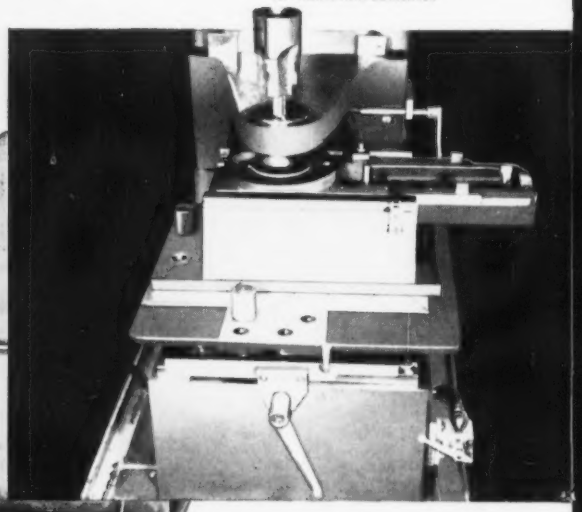
TWO MODELS AVAILABLE

2BH–6 spindle–¾" capacity
3BH–8 spindle–1½" capacity



Tool slides showing all four sides from which precision machining operations are performed.

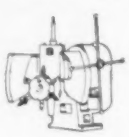
Close-up view showing pin locator air locked fixture for holding tool slide in first set-up. Other fixtures are similar.



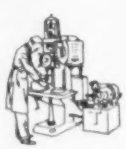
Specialists in High Production Turret Drilling

1C Manual Power Index ⅜" Capacity

2B Manual Power Index ¾" Capacity

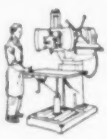


2BF Flange Mounted Power Index ¾" Capacity



2BH Automatic Hydraulic ¾" Capacity

3BH Automatic Hydraulic 1½" Capacity



2BR Ram Type Radial Drill ¾" Capacity

2PT-3PT Automatic Tape Controlled ¾" and 1½" Capacity

machined 5 times faster

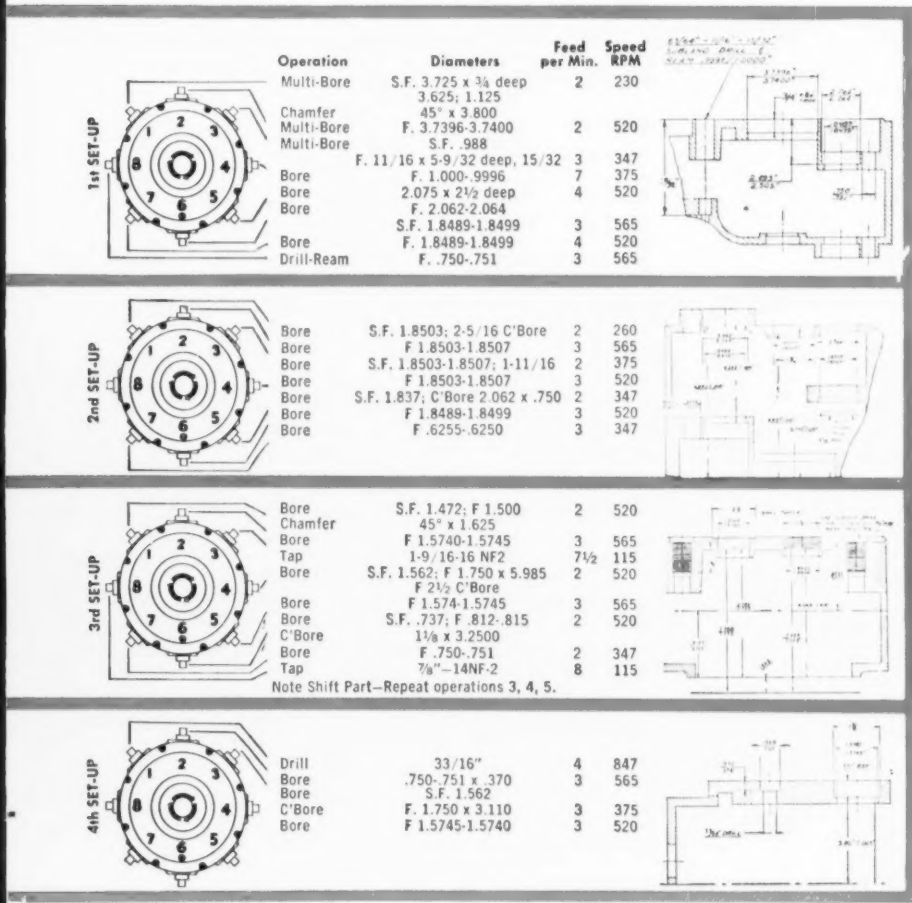
AUTOMATIC HYDRAULIC 8-SPINDLE TURRET DRILL

(1½" CAPACITY)

Burgmaster Automatic Hydraulic Turret Drills are designed to give both precision and speed. On machine slides, 26 operations on 14 centers are now machined in 2.5 hours average, which formerly required 12.5 hours on a horizontal boring mill—a saving of 80%. These operations include drilling, boring, reaming, spotfacing, and tapping, with bores held to .0004" tolerance and centers to .001". **Although the machine is used for many other jobs, this one alone repaid its cost in 1½ years.**

Automatic hydraulic machine operation is the answer which provides power indexing to the eight-spindle turret, pre-selects spindle speeds, provides infinitely variable pre-selective feeds, rapid approach and return, and accurate depth control. All operations are carried out at their most efficient rate for high finish, precision, accuracy, speed, and longest tool life.

Burgmaster engineers are prepared to suggest similar savings on your work. There is a Burg direct representative or dealer near you—consult them freely—there is no obligation.



	Operation	Diameters	Feed per Min.	Speed RPM
1st SET-UP	Multi-Bore	S.F. 3.725 x ¾ deep 3.625; 1.125	2	230
	Chamfer	45° x 3.800		
	Multi-Bore	F. 3.7396-3.7400	2	520
	Multi-Bore	S.F. .988 F. 11/16 x 5-9/32 deep, 15/32	3	347
	Bore	F. 1.000-.9996	7	375
	Bore	2.075 x 2½ deep	4	520
	Bore	F. 2.062-2.064 S.F. 1.8489-1.8499	3	565
	Bore	F. 1.8489-1.8499	4	520
	Drill-Ream	F. .750-.751	3	565
2nd SET-UP	Bore	S.F. 1.8503; 2-5/16 C'Bore	2	260
	Bore	F 1.8503-1.8507	3	565
	Bore	S.F. 1.8503-1.8507; 1-11/16	2	375
	Bore	F 1.8503-1.8507	3	520
	Bore	S.F. 1.837; C'Bore 2.062 x .750	2	347
	Bore	F 1.8488-1.8499	3	520
	Bore	F .6255-.6250	3	347
3rd SET-UP	Bore	S.F. 1.472; F 1.500	2	520
	Chamfer	45° x 1.625		
	Bore	F 1.5740-1.5745	3	565
	Tap	1-9/16-16 NF2	7½	115
	Bore	S.F. 1.562; F 1.750 x 5.985 F 2½ C'Bore	2	520
	Bore	F 1.574-1.5745	3	565
	Bore	S.F. .737; F .812-.815	2	520
	C'Bore	1⅛ x 3.2500		
	Bore	F .750-.751	2	347
	Tap	⅞"—14NF-2	8	115
	Note Shift Part—Repeat operations 3, 4, 5.			
4th SET-UP	Drill	33/16"	4	847
	Bore	.750-.751 x .370	3	565
	Bore	S.F. 1.562		
	C'Bore	F. 1.750 x 3.110	3	375
	Bore	F 1.5745-1.5740	3	520

How the job is run

Machine: Burgmaster 3BH Automatic Hydraulic 8-Spindle Turret Drill.

Part: Machine Slide.

Material: Close grain Moly Cast Iron.

Quantity: 50 per batch.

Holding: Special Pin Locator Air Locked Fixture, for each Set-up.

Closest Tolerances: .0004" on Bores, .001" between Centers.

Tooling: Carbide Tipped Tools.

Floor to Floor Time: 2.5 hours

Former Time: 12.5 hours each on Boring Mill.

Saving: 10 Hours each or 80%.

Write for bulletin describing Burgmaster 6 and 8 spindle Automatic Hydraulic Turret Drills in detail. Twenty-minute 16mm sound film showing Burgmaster turret drills in operation, including the new automatic positioning table, available from any office.

BURG TOOL

MANUFACTURING COMPANY, INC.

15001 South Figueroa Street, Gardena, California

FAculty 1-3510 DAvis 9-4158

BURGMASTER DIRECT SALES OFFICES:

Ridgewood, N.J.
86 North Maple Ave.
Gilbert 4-3002

Chicago 25, Ill.
5329 Lincoln Ave.
LOng Beach 1-1178

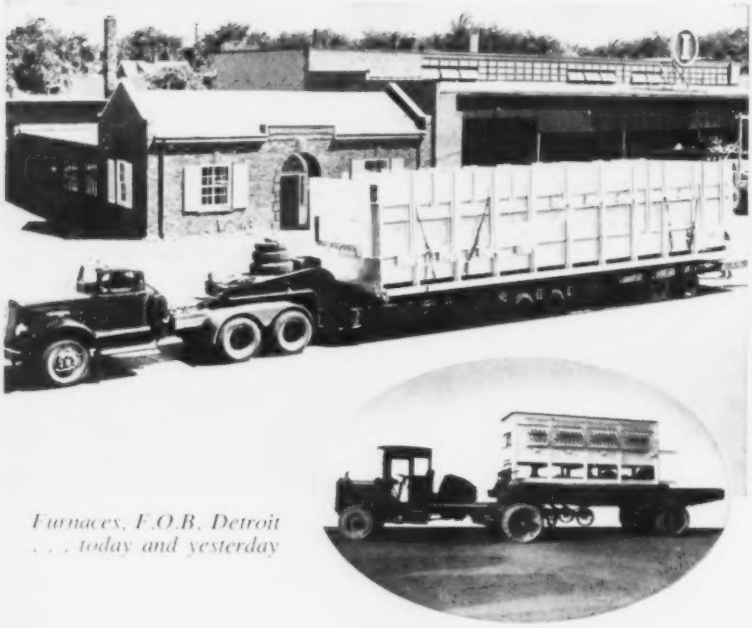
Cleveland 7, Ohio
14706 Detroit Ave.
ACademy 6-7030

Detroit 37, Mich.
13730 W. Eight Mile Rd.
LIncoln 8-4333

San Francisco, Calif.
1341 Old County Rd.
Belmont, Calif.
LYtle 1-0309

Plus dealer representatives in other industrial centers.

HOLCROFT • BLAZING THE HEAT TREAT TRAIL FOR OVER 40 YEARS



Furnaces, F.O.B. Detroit . . . today and yesterday

HOLCROFT "delivers the goods"

Back in '27, Holcroft, even then a company with many years of experience to its credit, custom-designed, built and delivered the electric, non-metallic heated walking beam furnace shown in the oval above . . . and at that time it was the most advanced, efficient furnace of its type then on the market.

Today, Holcroft is still "delivering the goods" . . . in the instance illustrated, a radiant-tube heated pusher type gas-carburizing furnace for automotive transmission parts. In the transition from the old to the new, it is worthy of note that Holcroft contributed substantially to the application of radiant-tube heating to continuous furnaces and pioneered in the development of gas carburizing. The basic principle, in fact, on which *all* modern gas-carburizing furnaces operate was disclosed by Holcroft engineers in 1935.

The same pioneering spirit is a guiding principle at Holcroft today. And when this "spirit" is combined with the experience, the research, engineering and manufacturing facilities that Holcroft offers, you can readily see why it pays to let Holcroft handle all phases of your heat treat furnace projects. May we be of assistance to you?

HOLCROFT AND COMPANY

6545 EPWORTH BOULEVARD • DETROIT 10, MICHIGAN

CHICAGO, ILL. • CLEVELAND, OHIO • HARTFORD, CONN. • HOUSTON, TEXAS • PHILA., PA.
CANADA: Walker Metal Products, Ltd., Windsor, Ontario

EXHIBITS, MEETINGS

(Continued from P. 13)

joint computer conference and exhibit, Dec. 9-13, Sheraton - Park Hotel, Washington, D. C. Information: IBM Corp., 1220 Nineteenth St., N. W., Washington, D. C.

The Material Handling Institute—Annual meeting, Dec. 10-11, Biltmore Hotel, New York. Society headquarters, One Gateway Center, Pittsburgh.

Society of the Plastics Industry, Inc.—Conference on vinyl products in the consumer field, Dec. 10-11, Hotel Commodore, New York. Society headquarters, 250 Park Ave., New York 17.

JANUARY

Society of Automotive Engineers, Inc.—Annual meeting, Jan. 13-17, Hotels Sheraton-Cadillac and Statler, Detroit. Society headquarters, 485 Lexington Ave., New York 17.

Malleable Founders' Society—Semi-annual meeting, Jan. 17, Hotel Cleveland, Cleveland. Society headquarters, 1800 Union Commerce Bldg., Cleveland.

Industrial Heating Equipment Assn.—Annual meeting, Jan. 27-28, Penn-Sheraton Hotel, Pittsburgh. Society headquarters, 1145 19th St., N. W., Washington 6, D. C.

FEBRUARY

Malleable Founders' Society—Technical and operating conference, Feb. 6-7, Wade Park Manor, Cleveland. Society headquarters, 1800 Union Commerce Bldg., Cleveland.

American Society for Quality Control—Annual conference on management by exception, Feb. 7-8, Carter Hotel, Cleveland. Information: B. F. Goodrich Chemical Co., 3135 Euclid Ave., Cleveland.

American Institute of Mining, Metallurgical & Petroleum Engineers—Annual meeting, Feb. 16-20, Hotels Statler and Sheraton-McAlpin, New York. Society headquarters, 29 W. 39th St., New York.

Quality in Ascendancy

The superiority of the vast number of products that are—and can be made from Roebling Cold Rolled Flat Spring Steel is a fact known throughout all industry.

You pay for mechanical and dimensional uniformity when you buy flat spring steel...you *get* it when you buy Roebling.

For information on how our products can help *yours*, write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING

Branch Offices in Principal Cities

Subsidiary of The Colorado Fuel and Iron Corporation

Roebling... Your Product is Better for it

An important NEW bulletin for every Structural Shop

THOMAS Wall Radial Drill
An Advanced Wall Radial Drill for use in Structural Steel Fabrication
The THOMAS Wall Radial is a column mounted drill arranged for vertical travel on the column and with radial coverage provided by the double hinged radial arm. Variable spindle speeds are provided and spindle feed is pneumatically powered
GENERAL SPECIFICATIONS
CAPACITY
SPINDLE SPEEDS
VERTICAL TRAVEL on COLUMN
LENGTH of RADIAL ARM
FRAMES
GEARS
SPINDLE BEARINGS
KNUCKLE BEARINGS
SPINDLE FEED
KNUCKLE LOCKS
SPINDLE CHUCK
VERTICAL TRAVEL
SPINDLE MOTOR
APPROXIMATE WEIGHT
392R

It's a bulletin you'll want to read . . . because the Thomas Wall Radial Drill is a "must" in every shop that depends upon production drilling. Its ready utility and extreme flexibility make it the handiest drilling tool you've ever used. Strong and sturdily built—like all Thomas machines—the Thomas Wall Radial Drill will meet every drilling need of structural and bridge fabricators.

Send for your copy of Bulletin 320 now!

Mail Today

Thomas Machine Mfg. Co., Pittsburgh 23, Pa.
Please send us your Bulletin 320.

Company _____

Address _____

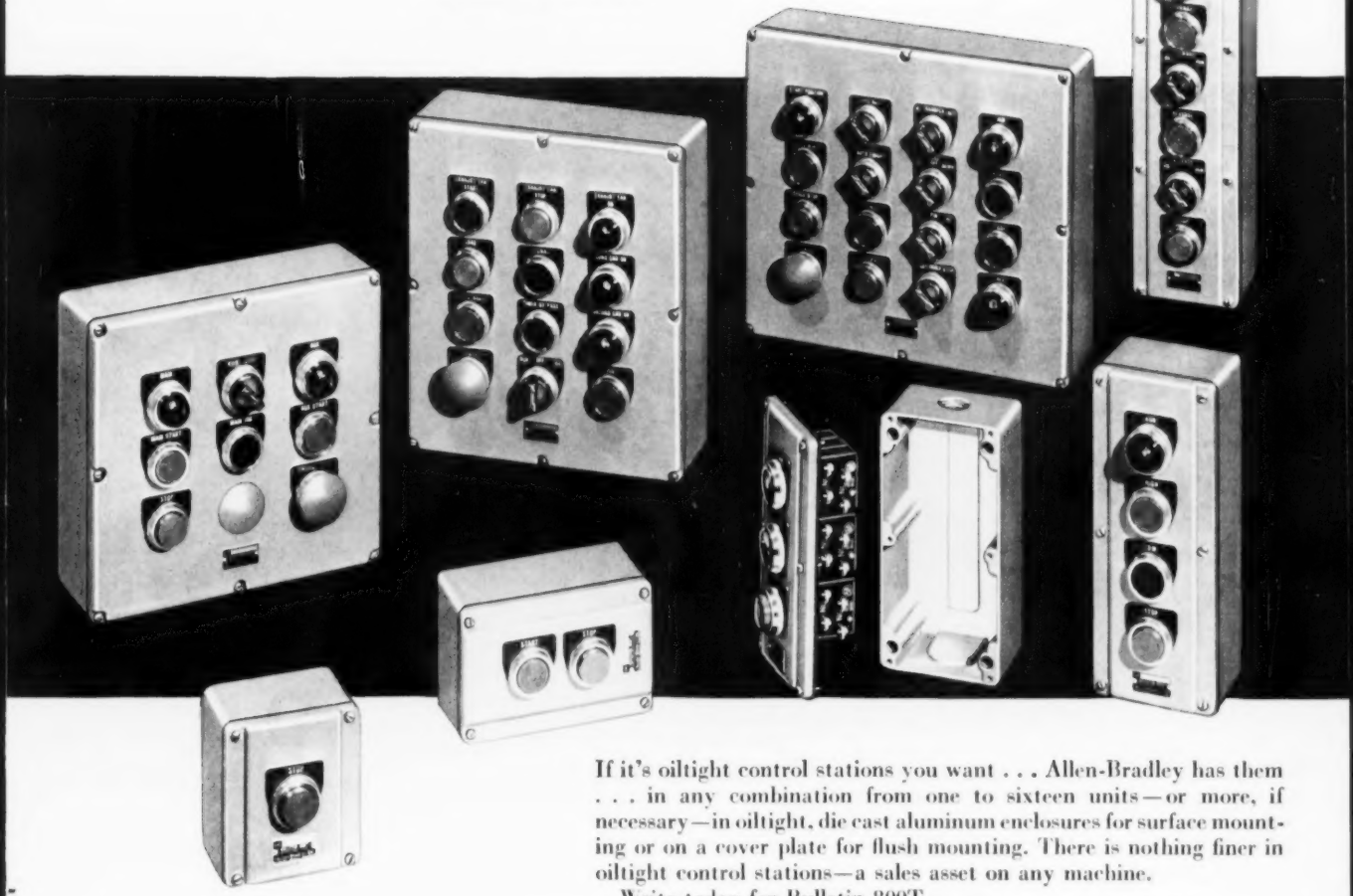
Title _____

47

THOMAS
MACHINE MANUFACTURING CO.
PITTSBURGH 23, PA.

NOTHING FINER IN oiltight control stations

BULLETIN 800T

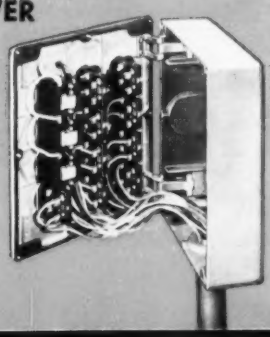


If it's oiltight control stations you want . . . Allen-Bradley has them . . . in any combination from one to sixteen units—or more, if necessary—in oiltight, die cast aluminum enclosures for surface mounting or on a cover plate for flush mounting. There is nothing finer in oiltight control stations—a sales asset on any machine.

Write today for Bulletin 800T.

HINGED COVER

The 9, 12, and 16-unit control stations have hinged covers. The hinge can easily be changed in the field from one side to the other.



ALLEN-BRADLEY
MOTOR CONTROL
QUALITY

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.
In Canada: Allen-Bradley Canada Ltd., Galt, Ont.

12-57-MR

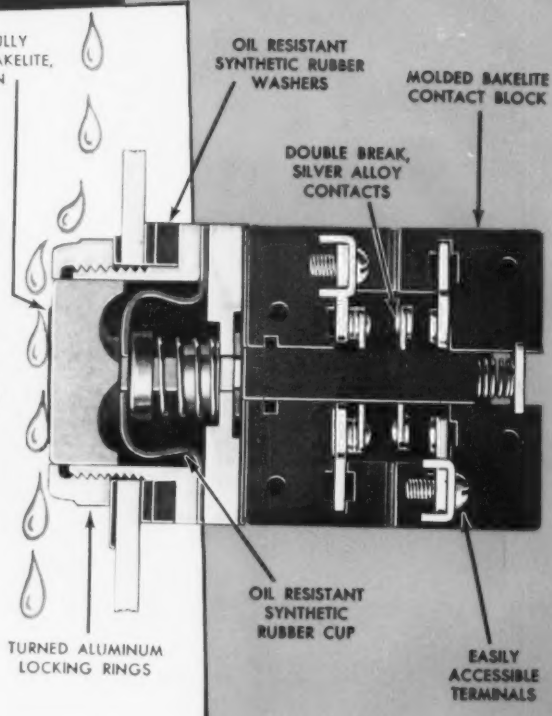
for machine tool application . . .

BULLETIN 800T

oiltight control units

These rugged, reliable units were designed as pilot controls for a-c and d-c magnetic motor control. The oil resistant synthetic rubber cup and washers keep cutting fluids and oil away from the contacts, and thus prevent trouble. Push button units can be furnished with one, two, or four contact blocks — each equivalent to a separate single pole, double throw, switch unit.

For attractive appearance plus long life with reliable operation, select Allen-Bradley control units.


LARGE, FULLY GUARDED, BAKELITE, BUTTON
OIL RESISTANT SYNTHETIC RUBBER WASHERS
MOLDED BAKELITE CONTACT BLOCK
DOUBLE BREAK, SILVER ALLOY CONTACTS
OIL RESISTANT SYNTHETIC RUBBER CUP
TURNED ALUMINUM LOCKING RINGS
EASILY ACCESSIBLE TERMINALS

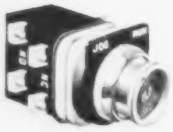
PUSH BUTTONS

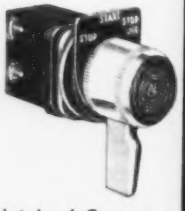
Flush Head Start" Button

Extended Head "Stop" Button

Mushroom Head for Easy Operation

Push Button with Cylinder Lock

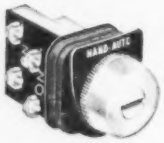

Push Button with "Selector" Sleeve

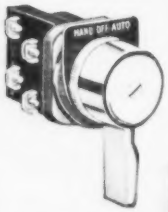

Wing Lever Push Button

Maintained Contact Push Buttons

SELECTOR SWITCHES

Three-Position Selector Switch

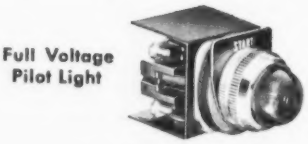

Two-Position Coin Slot Selector Switch

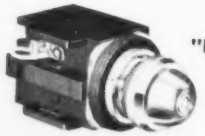

Wing Lever Selector Switch

Selector Switch with Cylinder Lock

PILOT LIGHTS

Transformer Type Pilot Light


Full Voltage Pilot Light

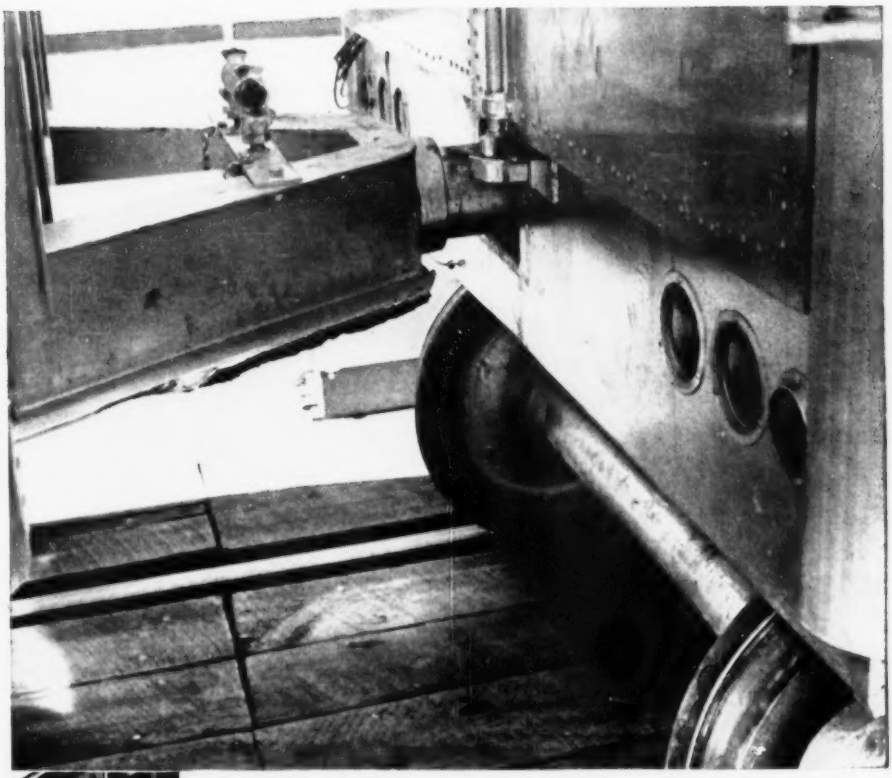

"Press-to-Test" Pilot Light

A-B QUALITY

ALLEN-BRADLEY
MOTOR CONTROL
QUALITY

Allen-Bradley Co.
1316 S. Second St., Milwaukee 4, Wis.
In Canada: Allen-Bradley Canada Ltd., Galt, Ont.

12-57-MR



Yoloy "E" high strength-low alloy steel provides required strength with less weight to the Railvan's underframing. Coupled view is shown at right.

C & O's new Railvans shown below — with combination highway and railroad wheels mounted on a single spring suspension system — operate either on the highway or railroad tracks.

C & O USES YOLOY "E" IN "FIRST" RAILVAN

Chesapeake and Ohio's new Railvan utilizes truck trailers that operate either as long trains on railroad tracks or as single units on highways. Such equipment employs a unique combination of railroad and highway wheels mounted on a single spring suspension system.

Hot Rolled Yoloy "E" Sheets and Plates—fabricated by Binkley Manufacturing Co. and Visioneering Company of Cleveland—form the rugged underframe required for railroad rolling stock. The tubular center sill was produced from 5½" A.P.I. Drill Pipe.

Youngstown's family of Yoloy steels are produced to meet a wide range of applications, where high strength and corrosion resistance are of prime importance. Call us today for a Youngstown Service Engineer to discuss your problem. Free Yoloy literature is available.

QUALITY YOUNGSTOWN SERVICE

Write for these free pamphlets in The Yoloy Family series:

YOLOY "E"
High Strength Low Alloy Steel—standard applications

YOLOY
High Strength Low Alloy Steel—special applications

YOLOY "S"
Higher Strength Steel for increased service life

YOLOY "C"
Corrosion Resistant Grade for deep forming

YOLOY PIPE
Continuous Weld for corrosion resistant applications

THE YOUNGSTOWN SHEET AND TUBE COMPANY
Manufacturers of Carbon, Alloy and Yoloy Steel
General Offices - Youngstown 1, Ohio
District Sales Offices in Principal Cities

Correct Lubrication in Action . . .

$13,388 saved in 6 months

Vulcanized Rubber and Plastics Company has been engaged for 75 years as a leader in precision molding and extrusion of hard and soft rubber—injection molded thermoplastic, and reinforced plastic parts for major industries and, in addition, is one of the world's largest manufacturers of combs.

Mobil **SOCONY MOBIL**

Leader in Lubrication for over 92 years

in the **Rubber and Plastics Molding Industry**

on maintenance, material, man-hours!

How the Vulcanized Rubber and Plastics Company made this substantial saving with the help of Socony Mobil!

In just six months the Vulcanized Rubber and Plastics Company has saved twice the total value of all its oils and greases purchased during the whole year of 1956! Beginning January, 1957, the company protected their Morrisville, Pennsylvania, plant with a Socony Mobil program of Correct Lubrication.

Plant engineer and Mobil lubrication specialists concentrated all their efforts towards improving efficiency of the plant's 42 hydraulic systems. Hydraulic fluids were standardized . . . filtering schedules set up . . . regular maintenance periods established. Periodic Mobil laboratory reports helped check oil quality and efficiency of filtration system.

Savings were swift and sizable. Downtime dropped sharply. Hundreds of repair and maintenance man-hours were eliminated . . . material costs cut. In total, $13,388 saved on the plant's hydraulic systems.

This is Correct Lubrication in Action. The cost-cutting program that devotes Mobil specialists, Mobil facilities, and Mobil's 92 years of lubrication experience to assure utmost protection and full service life from every Mobil product.

SUMMARY OF SAVINGS ACHIEVED THROUGH CORRECT LUBRICATION

* **$1,628 saved on hydraulic oils**—Following Mobil recommendations, plant replaced eight different hydraulic oils with only two Mobil products. This improved dispensing control . . . simplified reclamation . . . cut application time.

* **$2,400 saved on hydraulic system maintenance**—Before Mobil program, maintenance on hydraulic pumps, screens and valves in the injection molding department required two men on full-time basis. Program has proved so effective that equipment today requires only periodic inspection.

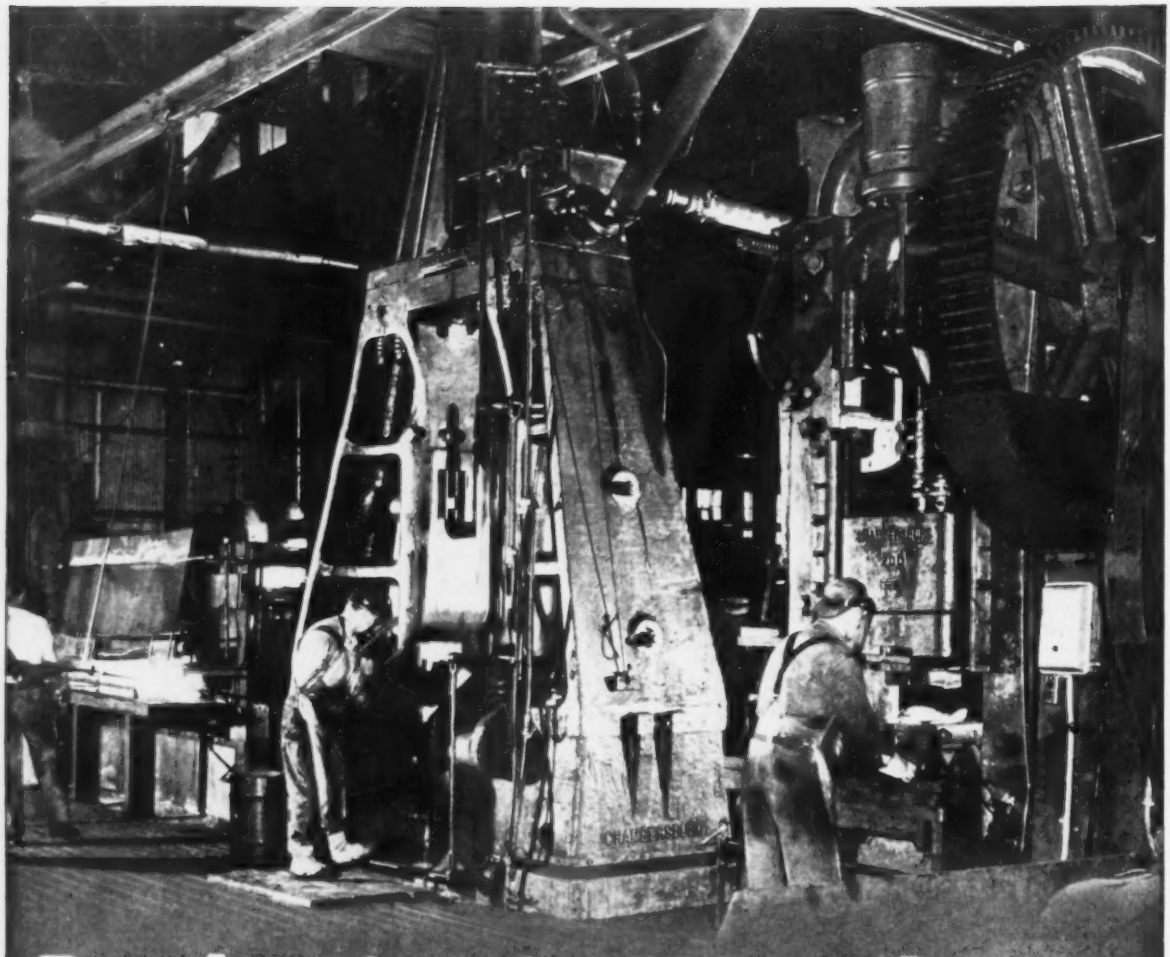
* **$100 per month saved on repair parts**—Prior to Mobil program, shafts on Vane-type pumps were snapping due to contaminants wedging into close-tolerance clearances. Cleaner oil and regular application under Mobil program eliminated problem . . . cut repair parts cost $600 in 6 months.

* **$8,760 recovered on press room operation**—Compared to same period in 1956, savings made in Vulcanized Rubber and Plastics Company's Press Room amounted to: $3,960 saved through elimination of downtime. $4,800 cut by reducing maintenance man-hours. Total—$8,760 saved in six months.

Correct Lubrication

A proved program to reduce manufacturing costs

SOCONY MOBIL OIL COMPANY, INC., and Affiliates: MAGNOLIA PETROLEUM CO., GENERAL PETROLEUM CORP., MOBIL OVERSEAS OIL CO., INC.



Production Increased 30%

Shown here is a 6000 lb. Chambersburg Steam Drop Hammer and a No. 200 Chambersburg Steel Side Trimming Press installed in a forge shop specializing in railroad car parts, gear blanks and general job forging. A 2000 lb. hammer and a No. 100 Trimmer are also installed. Hammers operate on air.

In replacing older hammers, the Chambersburgs were selected for the accuracy and quality of their manufacture. Experience to date shows maintenance costs are lowered, rejects are fewer, less down time is required, and as a result management figures production is up 30%!

If you are interested in getting similar results in your own shop, write for a copy of Bulletin 55-L-4.

CHAMBERSBURG ENGINEERING CO., CHAMBERSBURG, PA.

CHAMBERSBURG

"THE HAMMER BUILDERS"

better living

When you make anything in metal for homes, kitchens and appliances, and you want enduring beauty and sales appeal in your product . . . design it, improve it and protect it with McLOUTH STAINLESS STEEL.

specify

McLOUTH STAINLESS STEEL

HIGH QUALITY SHEET AND STRIP

for homes and home products

McLOUTH STEEL CORPORATION DETROIT, MICHIGAN

MANUFACTURERS OF STAINLESS AND CARBON STEELS

Talide® Tools... PROVED BEST BY TEST!

COSTS ONLY $1.65 Leading appliance manufacturer gets superior results with Talide standard brazed-type tool.

Machine	Gisholt Turret Lathe
Part	Stud for automatic washing machine 3/4" dia. x 4" long, 1045 Steel, Rockwell 28 "C".
Operation	Complete finishing including threading of end.
Tool	Standard Talide tool AL-10-5/8" sq. x 4", Grade S-90.
Speed (S.F.M.)	400 Feed .005" Depth of Cut .003"

	Talide Grade S-90	Next Best Premium Grade
Average No. of pcs. per grind	600	475
Average No. of regrinds per tool	16	14

90 DAYS OF GRUELING TESTS at eastern aircraft engine plant rates Talide Grade S-92 "Best by Test."

Here is one typical result:

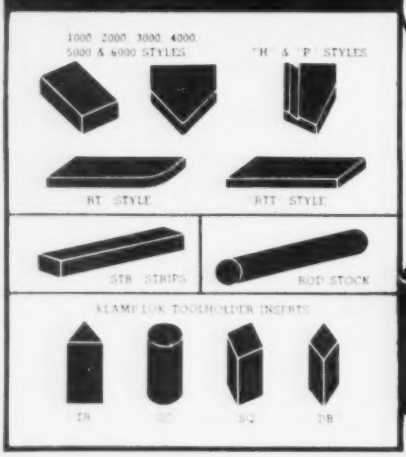
Machine	36" Bullard Multimatic
Material	AMS-5613 Stainless Steel
Operation	Facing, turning and boring 21" O.D. x 2.5" thick casting to size. (Heavy scale, bead weld, and out of round surfaces presented adverse machining conditions.)
Tools	TN-163P3 (1/2" I.C.) and SN-243P3 (3/4" sq.) Talide "Throw-away" triangular and square inserts.
Speed (S.F.M.)	375 to 1100 Feed .006" to .012"
Depth of Cut	.060 to .500
Result	27-34 Pc. average compared to 7-12 for next best premium grade—plus tool breakage cut 75%.

BEST CUTTING METAL FOR MACHINING CRANKSHAFTS

A large midwest automotive plant recently conducted an extensive test to determine the best cutting metal for machining crankshafts—the results proved TALIDE "BEST BY TEST!"

Machine	Fay Automatic Lathe Feed .006"
Speed	800 R.P.M. Depth of Cut .035"
Cutting Tool	Style TB-12123 Triangular Insert

Material	Talide Grade S-90	2nd Best Carbide	3rd Best Carbide
1141 Steel	175 pcs.	120 pcs.	97 pcs.
4140 Steel	128 pcs.	70 pcs.	65 pcs.
Armor Steel	83 pcs.	65 pcs.	65 pcs.



CONSTANT RESEARCH PAYS OFF!

Year after year Talide metal improves in hardness, strength, rupture resistance and crater resistance properties. Processed in latest type vacuum electric furnaces under rigid laboratory control all Talide grades are uniform and consistent in quality.

Call in a Talide sales engineer to recommend proper tooling for your machining operations, or write for 76-page catalog No. 56-G. METAL CARBIDES CORPORATION, 6001 Southern Blvd., Youngstown 12, Ohio.

METAL CARBIDES CORPORATION
TALIDE®
YOUNGSTOWN 12, OHIO

HOT PRESSED AND SINTERED CARBIDES • VACUUM METALS
HEAVY METAL • ALUMINUM OXIDE • HI-TEMP. ALLOYS
OVER 25 YEARS' EXPERIENCE IN TUNGSTEN CARBIDE METALLURGY

UNITED ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

Plants at Pittsburgh, Vandergrift, Youngstown, Canton, Wilmington.

SUBSIDIARIES: Adamson United Company, Akron, Ohio
Stedman Foundry and Machine Co., Inc., Aurora, Indiana

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.

Why designers specify FLEXLOC self-locking nuts

Where products must be tough . . . must stand up under vibration, shock and abuse . . . designers specify rugged, reliable, precision-built FLEXLOC self-locking nuts as fasteners.

HERE'S WHY:

FLEXLOC locknuts are strong: tensile strengths far exceed accepted standards. They are uniform: carefully manufactured to assure accurate, lasting spring tension in the flexible locking collars. And they are reusable: rough screw threads, repeated removal and replacement, frequent adjustments will not affect their locking life.

Standard FLEXLOC self-locking locknuts are available in a wide range of standard sizes and materials, to meet the most critical locknut requirements. Your authorized industrial distributor stocks them. Write us for complete catalog and technical data. Flexloc Locknut Division, STANDARD PRESSED STEEL CO., Jenkintown 17, Pa.

We also manufacture precision titanium fasteners. Write for free booklet.

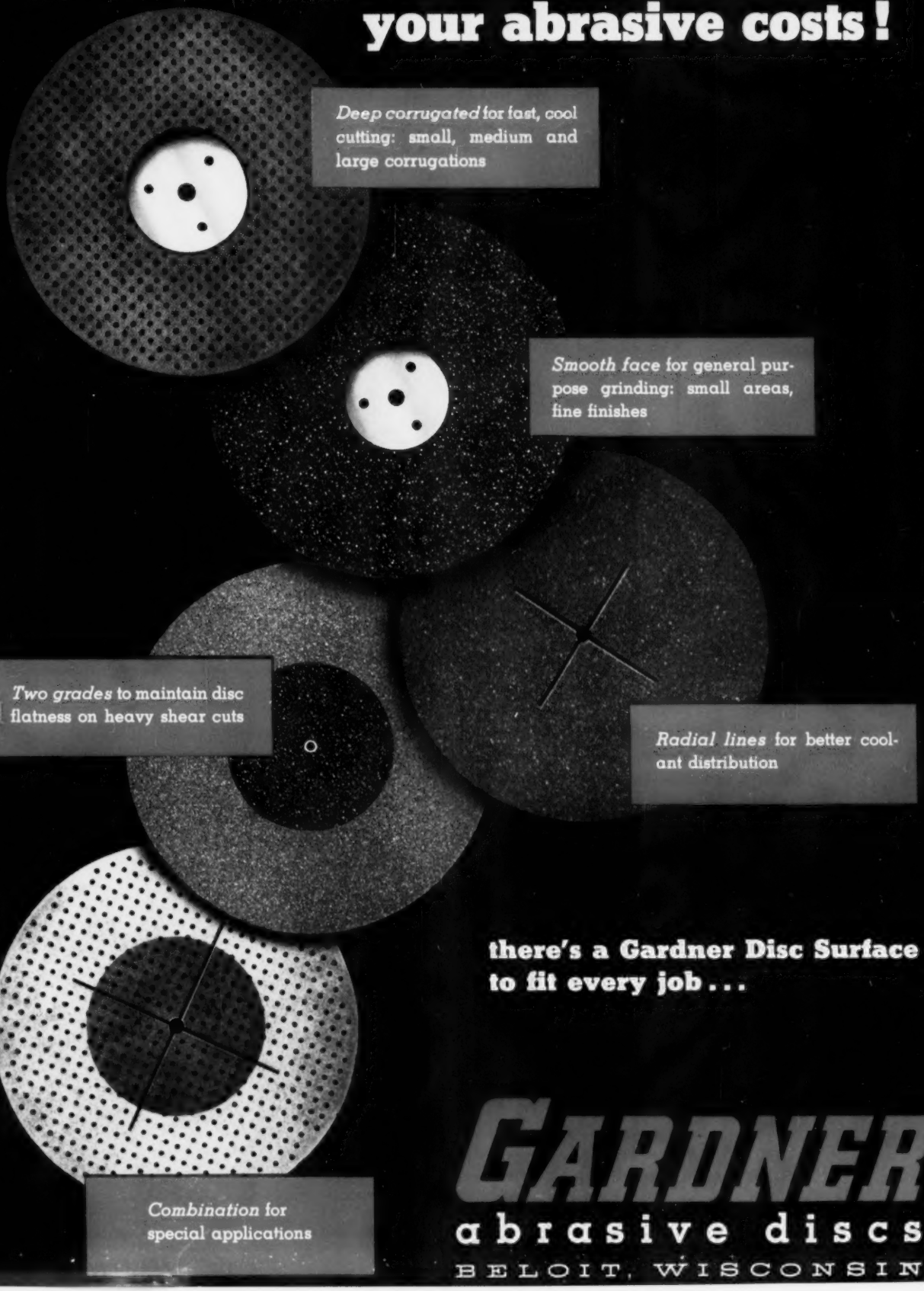
FLEXLOC® LOCKNUT DIVISION

STANDARD PRESSED STEEL CO.

SPS

JENKINTOWN PENNSYLVANIA

The right disc *surface* can *lower* your abrasive costs!



Deep corrugated for fast, cool cutting: small, medium and large corrugations

Smooth face for general purpose grinding: small areas, fine finishes

Two grades to maintain disc flatness on heavy shear cuts

Radial lines for better coolant distribution

Combination for special applications

there's a Gardner Disc Surface to fit every job . . .

GARDNER

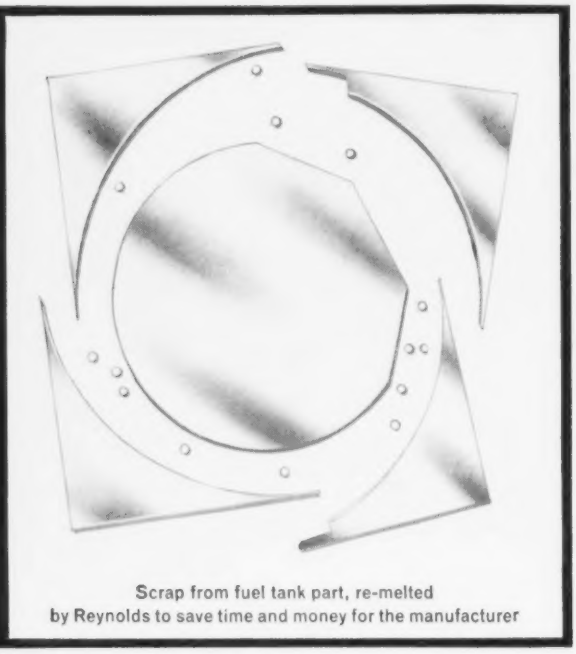
abrasive discs

BELOIT, WISCONSIN

REYNOLDS ALUMINUM BLANKS

cut scrap loss and handling costs... speed production... improve product quality

Aluminum blank for fuel tank part supplied to aircraft manufacturer by Reynolds



Scrap from fuel tank part, re-melted by Reynolds to save time and money for the manufacturer

Scrap loss from punching, shearing, piercing and other fabricating operations often runs 30% or more—but this is a problem *off your hands* when you order aluminum blanks to your specifications from Reynolds.

Blanks from Reynolds assure you only the metal you actually need and use. They also save you scrap handling, storing and shipping expense. They speed your production by eliminating rejects, work stoppages and special operations. They simplify your cost control because you don't have to contend with fluctuating scrap prices. And they assure product quality because Reynolds controls quality from mine to finished part.

For details on blanks or on completed parts and final assemblies, call your nearest Reynolds office or write *Reynolds Aluminum Fabricating Service, 2062 S. Ninth Street, Louisville 1, Kentucky.*

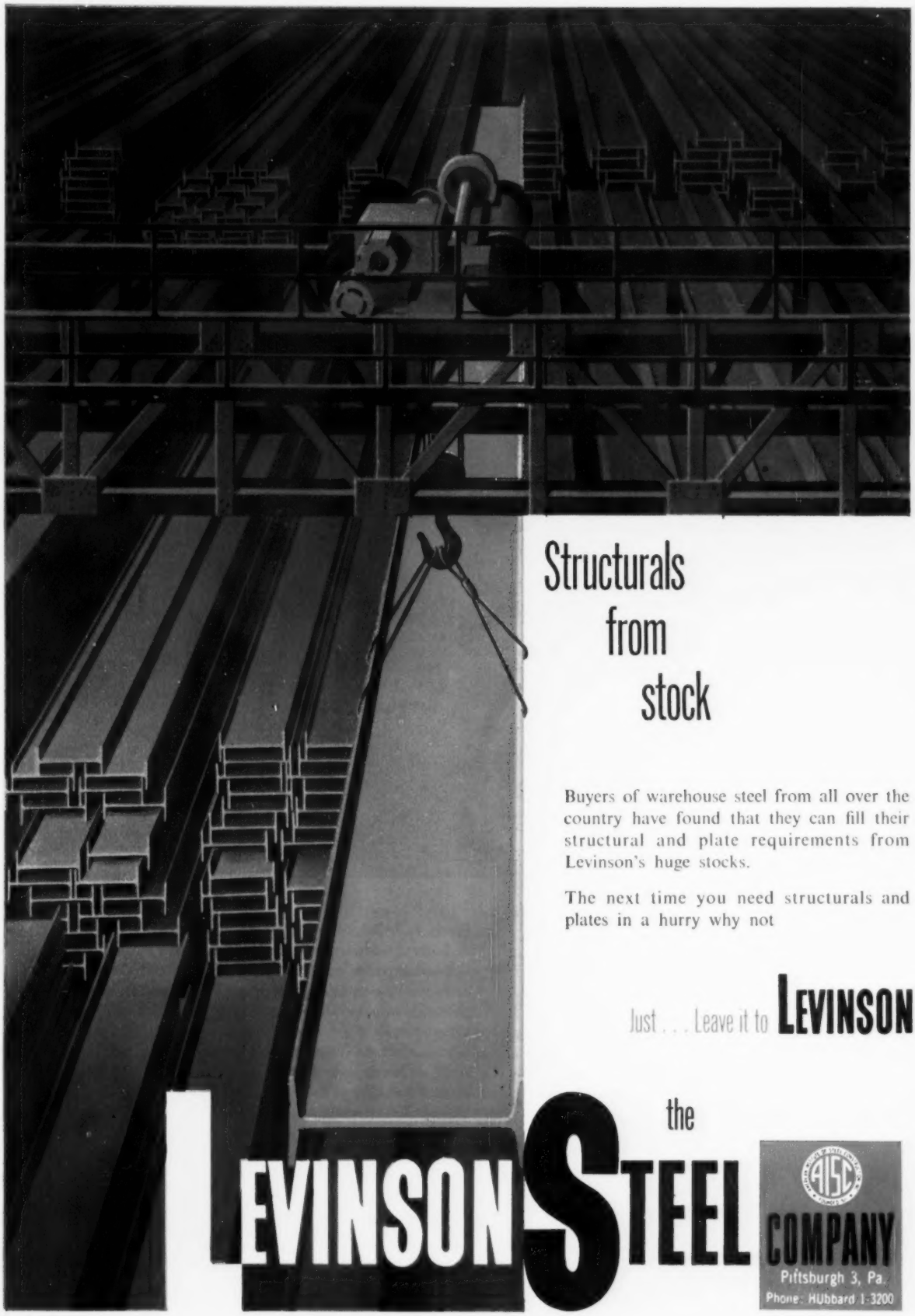
Watch Reynolds All-Family Television Program "DISNEYLAND", ABC-TV

The Finest Products Made with Aluminum are made with REYNOLDS ALUMINUM

REYNOLDS ALUMINUM Fabricating Service

BLANKING • EMBOSSING • STAMPING
DRAWING • RIVETING • FORMING • WELDING
ROLL SHAPING • TUBE BENDING • BRAZING • FINISHING

LINDE offers you another



Structurals from stock

Buyers of warehouse steel from all over the country have found that they can fill their structural and plate requirements from Levinson's huge stocks.

The next time you need structurals and plates in a hurry why not

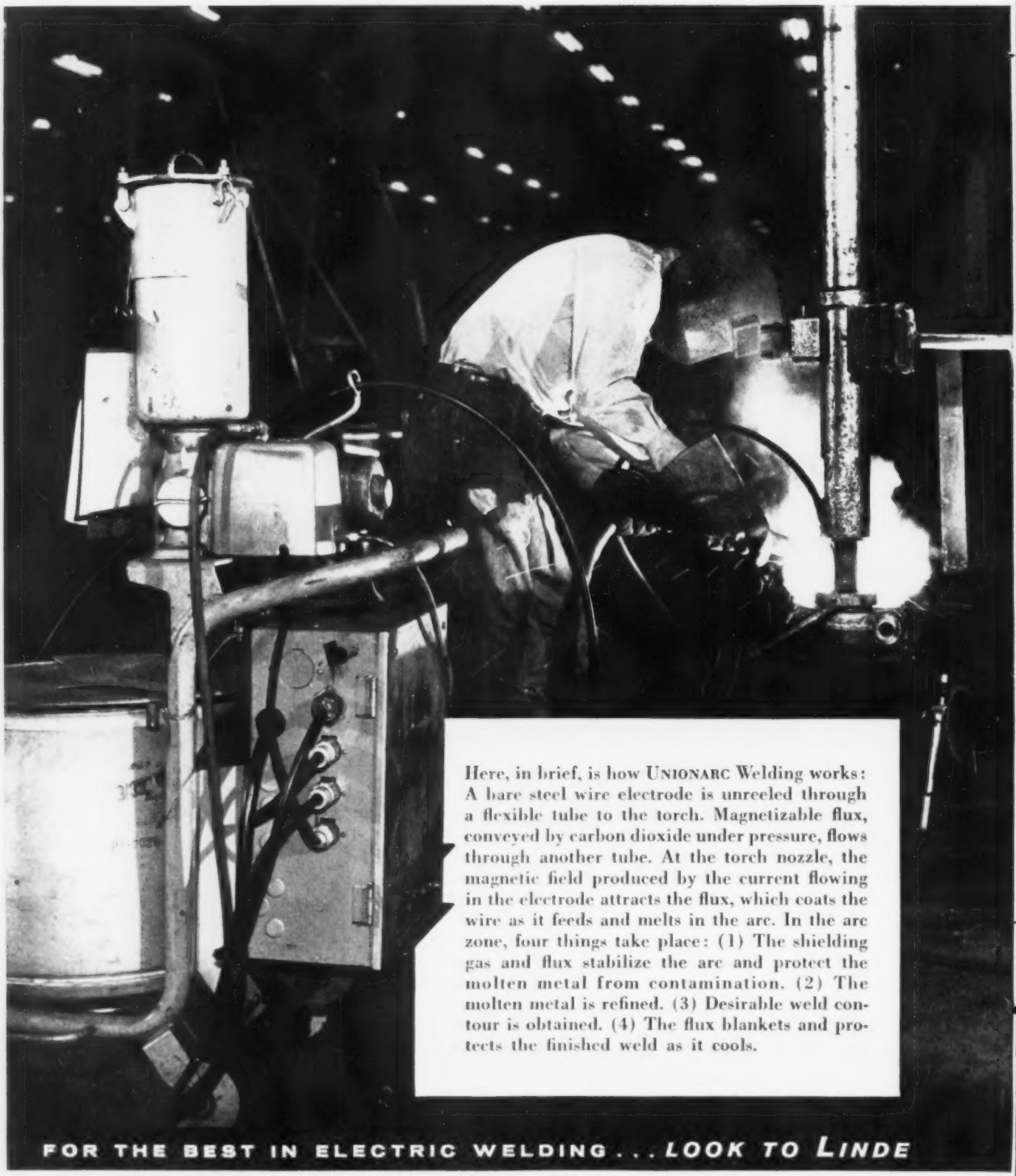
Just . . . Leave it to **LEVINSON**

the **LEVINSON STEEL COMPANY**

Pittsburgh 3, Pa.
Phone: HUbbard 1-3200

modern welding method=

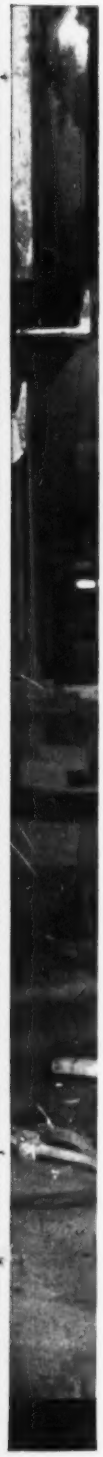
Now... LINDE offers you another UNIONARC Magnetic



Here, in brief, is how UNIONARC Welding works: A bare steel wire electrode is unreeled through a flexible tube to the torch. Magnetizable flux, conveyed by carbon dioxide under pressure, flows through another tube. At the torch nozzle, the magnetic field produced by the current flowing in the electrode attracts the flux, which coats the wire as it feeds and melts in the arc. In the arc zone, four things take place: (1) The shielding gas and flux stabilize the arc and protect the molten metal from contamination. (2) The molten metal is refined. (3) Desirable weld contour is obtained. (4) The flux blankets and protects the finished weld as it cools.

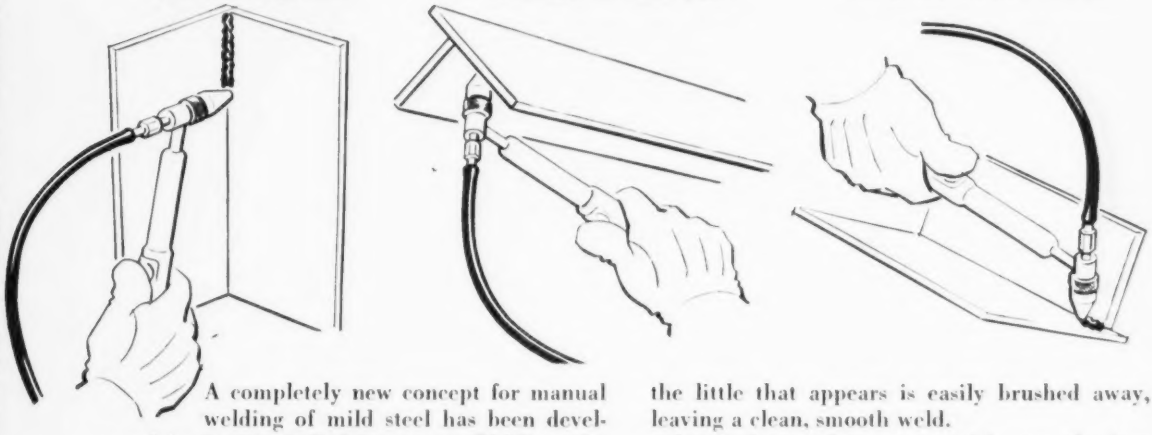
FOR THE BEST IN ELECTRIC WELDING . . . *LOOK TO LINDE*

modern welding method– Flux Gas Shielded Arc Welding



UNIONARC *is an entirely new method of welding steel in all manual positions...*

VERTICAL **OVERHEAD** **DOWNHAND**



A completely new concept for manual welding of mild steel has been developed by LINDE. Called UNIONARC Welding, the method uses a continuously-fed bare steel wire electrode, which is magnetically coated with flux and shielded by carbon dioxide. The torch can be easily handled in all welding positions—vertical, overhead, downhand. Manual welds can be made at higher speeds and at lower cost than with covered electrodes. UNIONARC Welding produces high-quality welds in steel, even when moderate amounts of rust, scale, and moisture are present.

Among the numerous advantages of UNIONARC Welding are these: Rate of operation is up to three times faster than with covered electrodes. There is no stopping to renew electrodes, since a single loading of wire can be fed smoothly and continuously for periods up to a week. Manual skill needed is no more than that required with covered electrodes. In vertical and overhead positions, the deposition rate in UNIONARC Welding is two to three times greater than with covered electrode methods; in downhand positions, up to twice as great. There is practically no spatter—the little that appears is easily brushed away, leaving a clean, smooth weld.

LINDE has made many notable contributions to welding. Among these are the introduction and development of submerged arc welding (UNIONMELT Welding), non-consumable electrode, inert gas shielded arc welding (HELIARC Welding), and the development of Sigma (shielded inert gas metal arc) welding. LINDE's newest method, UNIONARC Welding, is another *first*—a truly important contribution. Its simplicity and versatility make it unique. Its efficiency and economy have been proved in actual production work. Write *now* for details about UNIONARC Welding, or call the LINDE office nearest you.

LINDE COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y. Offices in other principal cities. *In Canada:* Linde Company, Division of Union Carbide Canada Limited.

The terms "LINDE," "HELIARC," "UNIONMELT," "UNIONARC," and "UNION CARBIDE" are trade marks of Union Carbide Corporation.

Linde TRADE-MARK

UNION CARBIDE

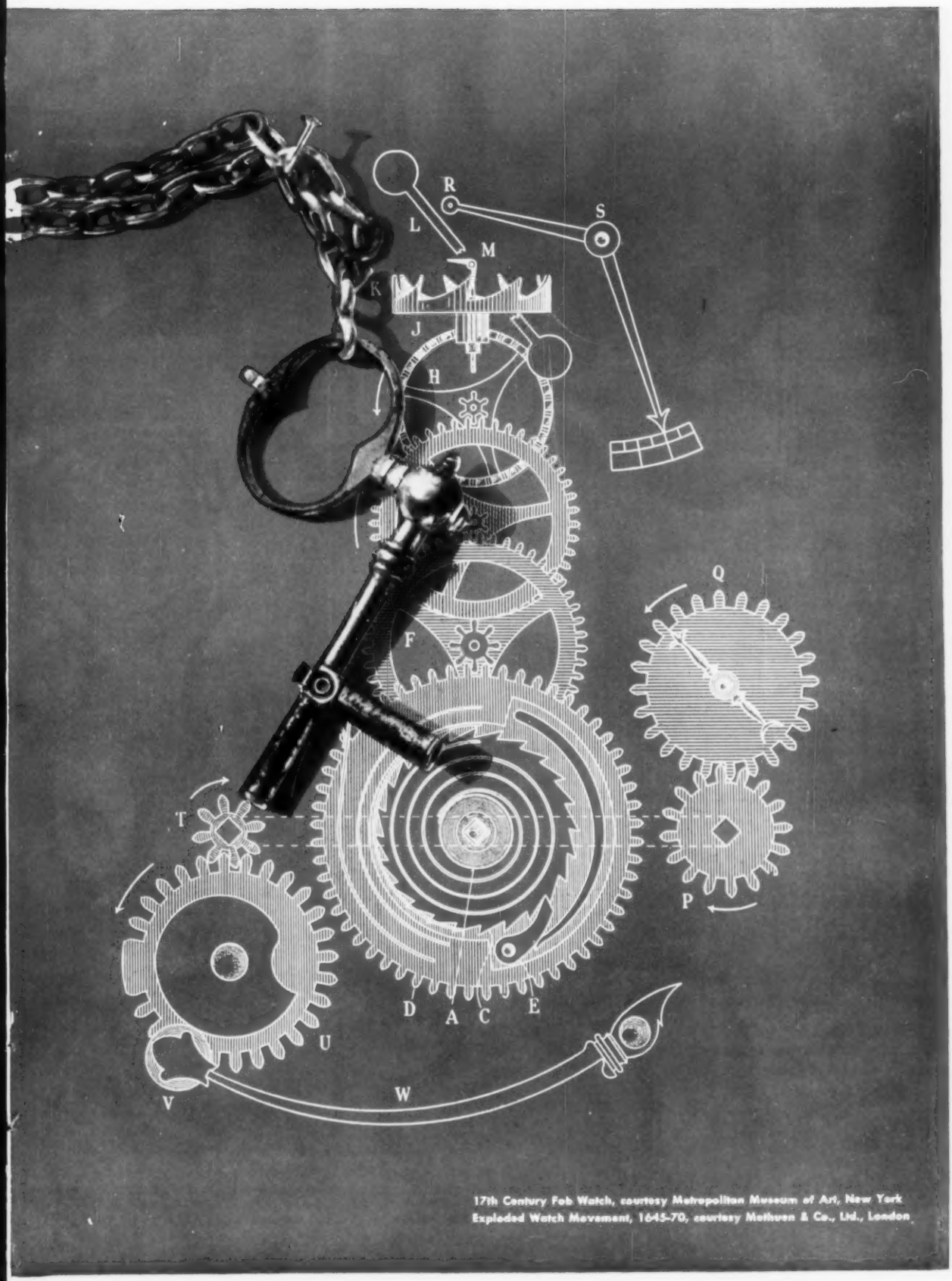
LIKE CLOCKWORK, Eastern's automated *in-touch* control system gives you customer service data in a matter of minutes.

For complete information on orders in process, speedy replies to inquiries about specific requirements and exact reports on stock available for immediate delivery . . . contact Eastern's Customer Service Department.

ES

Eastern Stainless Steel Corporation • Baltimore 3, Maryland, U.S.A.

GENERAL ELECTRIC PROGRESS TOWARD FASTER RESCHEDULING:
Speed-regulating system at Atlantic Steel

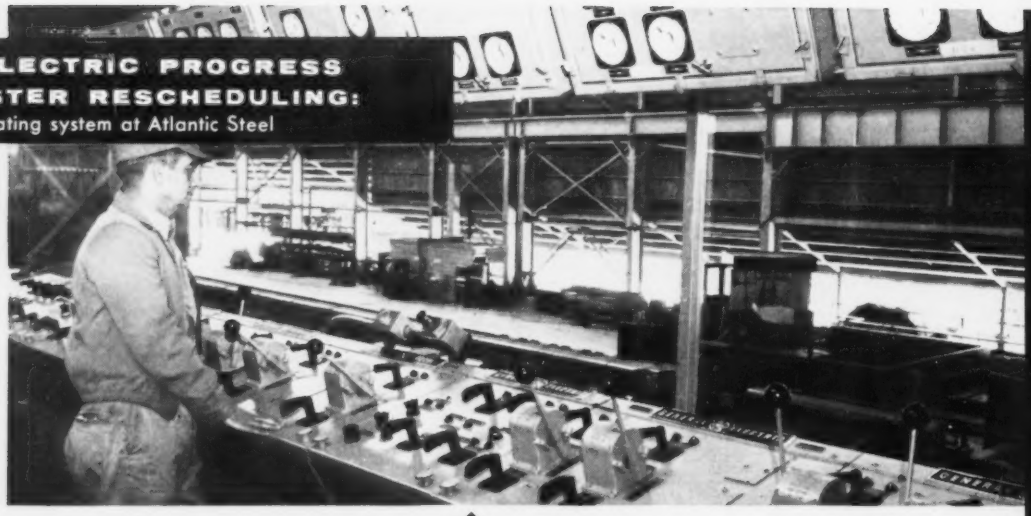


17th Century Fob Watch, courtesy Metropolitan Museum of Art, New York
Exploded Watch Movement, 1645-70, courtesy Methuen & Co., Ltd., London

GENERAL ELECTRIC PROGRESS
TOWARD GREATER PRODUCTION:

GENERAL ELECTRIC PROGRESS TOWARD FASTER RESCHEDULING:

Speed-regulating system at Atlantic Steel

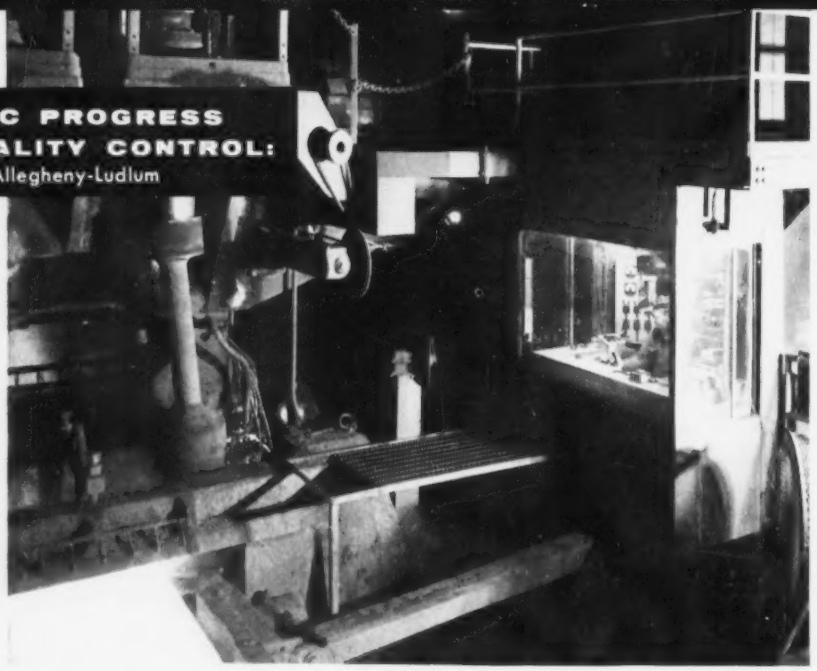


COMBINATION MERCHANT BAR AND ROD MILL at Atlantic Steel is one of world's fastest. Powered by a G-E co-ordinated drive system, it has a top speed of 5000 fpm for rods, 2000 fpm for merchant products. Pumpless ignitron rectifiers supply d-c power to main drive motors totalling 8450 hp. Centralized operator's control shown co-ordinates mill operations, permits using trained manpower most efficiently.

NEW AMPLISTAT-AMPLIDYNE SPEED REGULATING SYSTEM for mill motors holds 0.25% steady-state speed error from no-load to full-load, permits setting no-load speed essentially equal to rolling speed. This provides faster setting up and rescheduling. Faster response is also obtained to reduce over- and under-feed caused by impact speed drop, thereby minimizing buckling and pulling in the rod or bar.

GENERAL ELECTRIC PROGRESS TOWARD CLOSER QUALITY CONTROL:

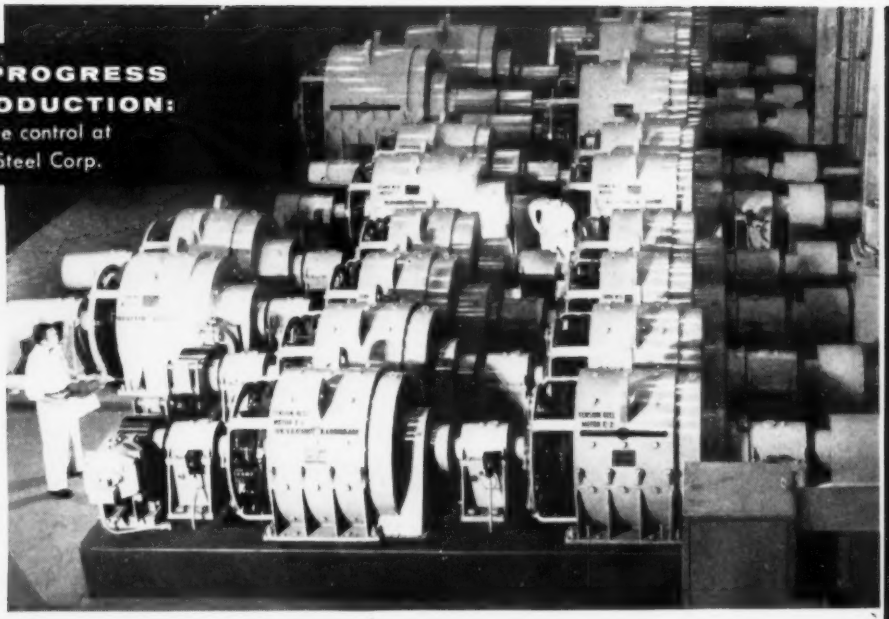
Card program system at Allegheny-Ludlum



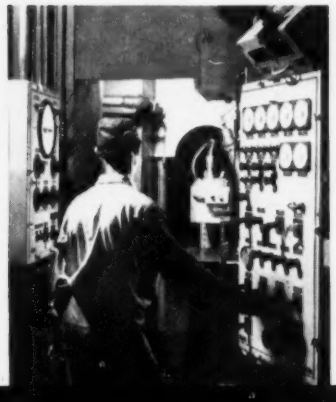
FOR FIRST TIME in the steel industry, a G.E.-developed punched-card system automatically programs and controls roll openings and mill speed on Allegheny-Ludlum's Brackenridge reversing rougher, permitting closer tolerances, closer quality control.

GREATER PROCESS FLEXIBILITY is provided by G-E card program control. Using standard punched card compatible with accounting, data logging, and processing systems, operator can maintain large number of optimum schedules, for wide variety of products. A 15-pass schedule and product data is programmed on one card. Operator selects desired card, inserts it in "card reader" (see photo), and pushes "next pass" button to start each pass. Card control system automatically sets the screw position and mill speed for the pass. Accuracy of the system is 0.010 inches with a maximum roll opening of 9.99 inches. Settings are provided every 0.01 inches.

GENERAL ELECTRIC PROGRESS TOWARD GREATER PRODUCTION:
Higher speed with automatic gage control at Weirton Steel Division, National Steel Corp.



MORE AUTOMATIC OPERATION at Weirton Steel's new 5-stand tandem cold mill is provided by G-E automatic gage control. Shown below are X-ray indicator for Stand 1, X-ray gage, and operator's main control panel.



WORLD'S MOST POWERFUL, Weirton's new cold strip mill contains G-E drives totalling 28,000 hp. Specially designed to fit mill's rigid space needs, G-E low-inertia d-c drive motors (above) provide fast acceleration and balanced speed regulation. Automatic gage control, developed by G.E. for the steel industry, helps this mill produce higher quality steel, with closer tolerances, at higher rolling speeds. System utilizes X-ray gages at Stands 1 and 5 controlling thickness through screwdown position at Stand 1 and main drive motor speed at Stand 5.

THESE EXAMPLES OF DRIVE-ENGINEERING PROGRESS SHOW . . .

General Electric systems contribute to steel industry's increase in productivity

As the steel industry accelerates its evolution from mechanization to automation, there is an increasing trend to larger machinery, higher processing speeds, and greater production capabilities. Keeping pace with this trend, General Electric is constantly developing the new and improved electrical techniques, systems and equipment required.

For example, horsepower levels on main and auxiliary drives are being raised, greater precision in automatic control is being achieved, and new methods of electrically regulating and programming work in progress are being used. New steel-mill drive systems are being designed in close co-operation with steel industry engineers and machinery builders to fit the still newer developments anticipated tomorrow. And system equipment continues to stress dependability and minimum maintenance to keep steel mill productivity high.

A few examples of General Electric developments along these lines are shown here. To serve *your* needs for automating electrically, profit from G.E.'s complete engineering services and system-engineered electric equipment. Contact your nearest General Electric Apparatus Sales Office. General Electric Co., Schenectady 5, N. Y.

652-118

Engineered Electrical Systems for the Steel Industry

GENERAL ELECTRIC

New Design Trends for

Harvey Aluminum Extrusions

To any experienced engineer or designer, aluminum extrusions are a common commodity. You don't have to tell him that extrusions offer such advantages as ease of fabrication, design flexibility, etc. He knows that. What he wants to know now are the newest advances made possible by the extrusion process.

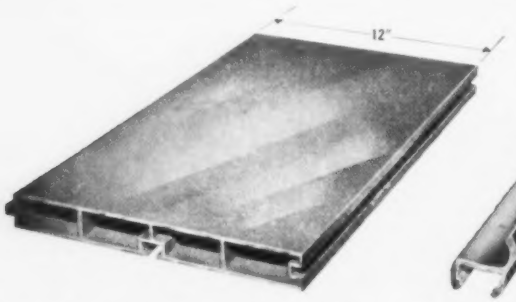
Potential for new configurations and applications

Typical new applications for Harvey Aluminum Extrusions are illustrated below. The design possibilities for aluminum extrusions are now practically limitless. Large heavy press sections; unusually complex shapes; wide, integrally stiffened skin panels; solid, hollow, and stepped extrusions; and extra long thin sections can be obtained from Harvey in all aluminum alloys. Heat-treated shapes can be produced in lengths up to 80 feet, weighing as much as 2,500 pounds. The maximum circumscribing circle diameter practical is 25½ inches. For functional, structural, or decorative applications demanding custom design plus light weight, corrosion resistance, high strength, and a naturally attractive finish, Harvey Aluminum Extrusions are first choice. And remember, Harvey is traditional for high quality and service.

Harvey Aluminum leads in extrusions

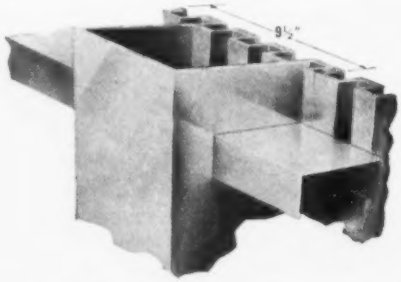
Harvey's completely integrated facilities include a large complement of extrusion presses ranging in size from 1400 tons to 12,000 tons, stretch-straighteners up to 3,000,000 pounds capacity for lengths up to 105 feet, and the newest supporting and finishing equipment.

If you have a problem with extrusions, thoroughly qualified Harvey specialists are always ready to help you improve your product. Write to Harvey Aluminum Sales, Inc., Torrance, California, or contact the nearest sales office listed under "Aluminum" in your classified telephone directory.



PANEL for highway signs. Extruded aluminum shape offers maximum strength and economy. Design combines several functions within a single shape. Light weight eases erection. Aluminum's natural, attractive finish and resistance to corrosion minimizes maintenance.

AUTOMOTIVE WINDOW FRAME combines utility with natural brilliance, eliminating costly plating operations. Rust is never a problem. This extruded shape typifies the trend in using aluminum for both decorative and functional applications in the automotive industry.



STRUCTURAL ASSEMBLY of extruded shapes is utilized for large span hangar and warehouse doors, building walls, and other components. Both structure and enclosure are formed by combining two aluminum extrusions. Interlocking design speeds and simplifies erection.

Making the most of aluminum . . . for everyone

HARVEY ALUMINUM SALES INC., TORRANCE, CALIFORNIA

HARVEY Aluminum

Harvey is a leading independent producer of quality aluminum products in all alloys and sizes: Rod and bar, pipe, tube, hollow sections, press forgings, forging stock, impact extrusions, structurals, special shapes, extrusions, screw machine products and other aluminum products. Harvey is also producing similar items in titanium and steel.

Why YOU CAN MAKE BETTER PARTS

with B&L

STRAIN TEMPERED® BAR STEELS

- ELIMINATE COSTLY HEAT TREATING
- SAVE STRAIGHTENING OPERATIONS
- MINIMIZE WARPAGE TENDENCIES
- INSURE DIMENSIONAL ACCURACY

For your further interest, we have prepared Bulletin No. 58. Write for your copy today.

WHEN we say *better parts*, we mean it in two important ways:

Better suited for your fabricating operations

Better adapted for your service applications

Strain-Tempered Bars come tailored to your order . . . pre-conditioned to provide the right combination of physicals for your job requirements, as attested by a B&L Certificate of Analysis.

In addition, you get an actual machined test part with each shipment of Strain-Tempered C1144, sampled from your lot of bar steels . . . prepared in our laboratory according to the B&L Machinability Chart.

These extra services mean increased results from the steel you buy . . . plus a definite, proved economy in your production.

BLISS & LAUGHLIN, INC.

GENERAL OFFICES: HARVEY, ILLINOIS

SALES OFFICES IN ALL PRINCIPAL CITIES

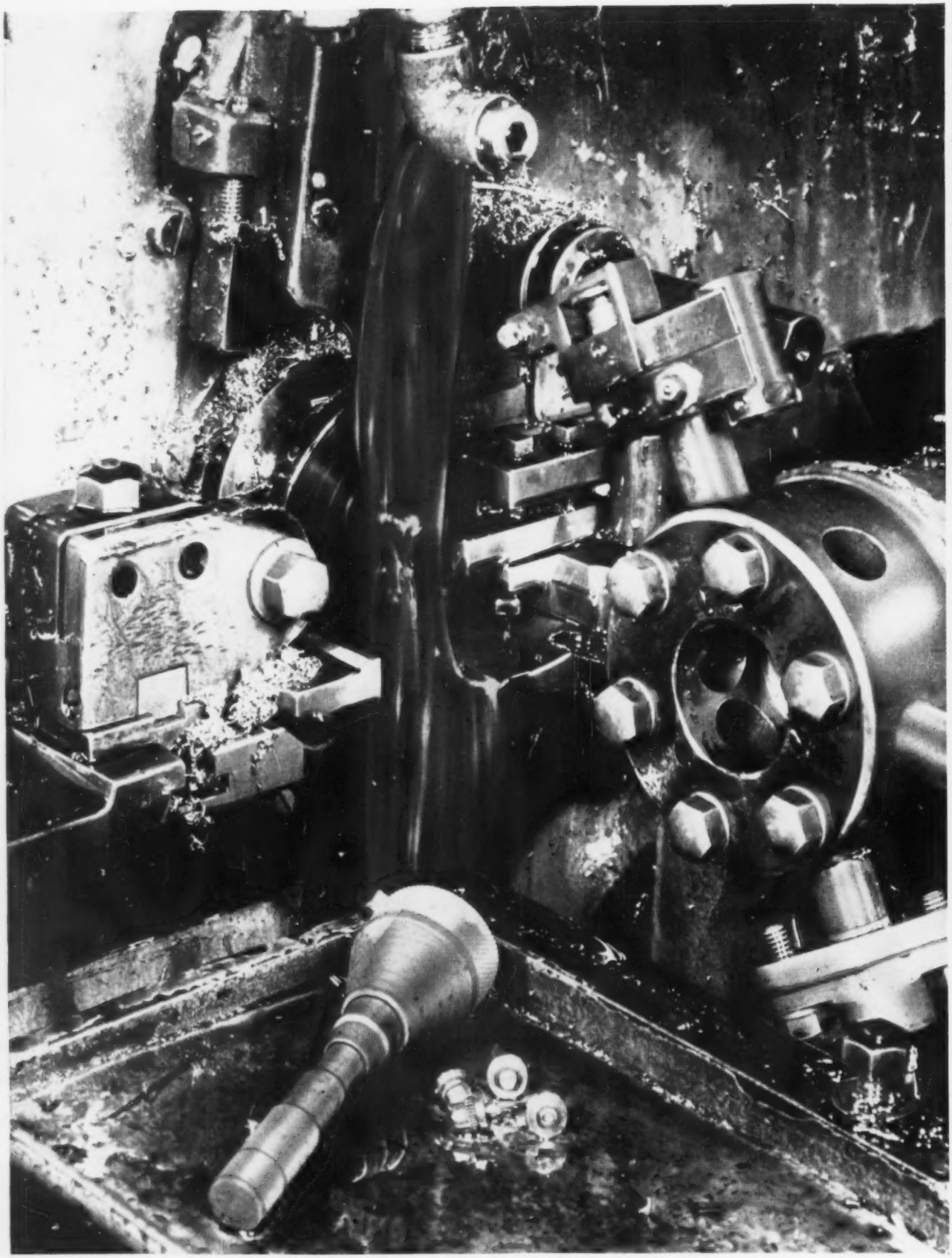
FOUR PLANTS:—

HARVEY, ILL.

DETROIT, MICH.

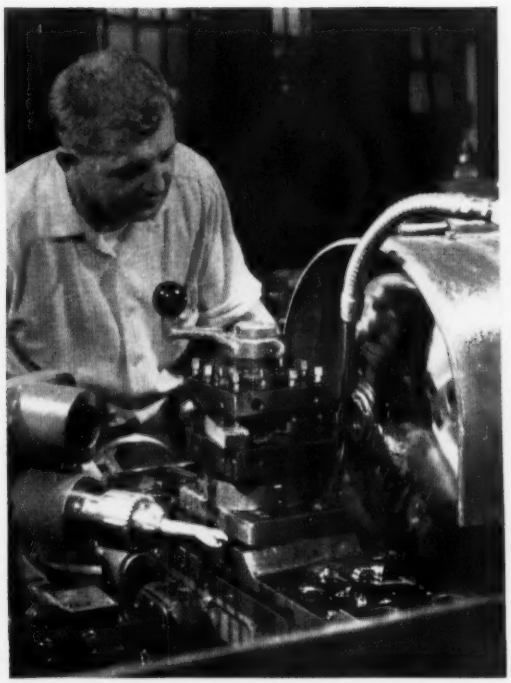
BUFFALO, N. Y.

MANSFIELD, MASS.



The tool is cutting steel, but the oil is cutting costs . . . because it's

GULFCUT!



Gulfcut 11D at work in J&L turret lathe at M&O Manufacturing Company, Wallingford, Connecticut.

This automatic screw machine uses Gulfcut, which contributes to longer tool life, finer finishes. Dictaphone Corporation has been using Gulfcut exclusively for the past 10 years.

It's Gulfcut 31C, to be exact—the sulfurized-mineral-lard cutting oil used at Dictaphone Corporation, Bridgeport, Connecticut. Mr. Joseph A. Maloney, Process Engineer, says: "We get steady production at an even rate, using Gulfcut—hold tolerances as close as 3 ten-thousandths—get the combination of lubrication and cooling that leads to longer tool life, better finishes, fewer rejects!"

Dictaphone is only one of scores of companies that are trimming machining costs through the use of Gulfcut cutting oils. We think Gulfcut can improve your machining practice, too. In Gulf's complete line, there's a Gulfcut cutting oil for your every metal cutting need. Each is specifically compounded to meet specific requirements. Each is scientifically made to help you cut costs. And your Gulf Sales Engineer will gladly recommend the proper oils for you. Just contact your nearest Gulf office.

Gulf Oil Corporation
Dept. DM, Gulf Building
Pittsburgh 30, Pa.

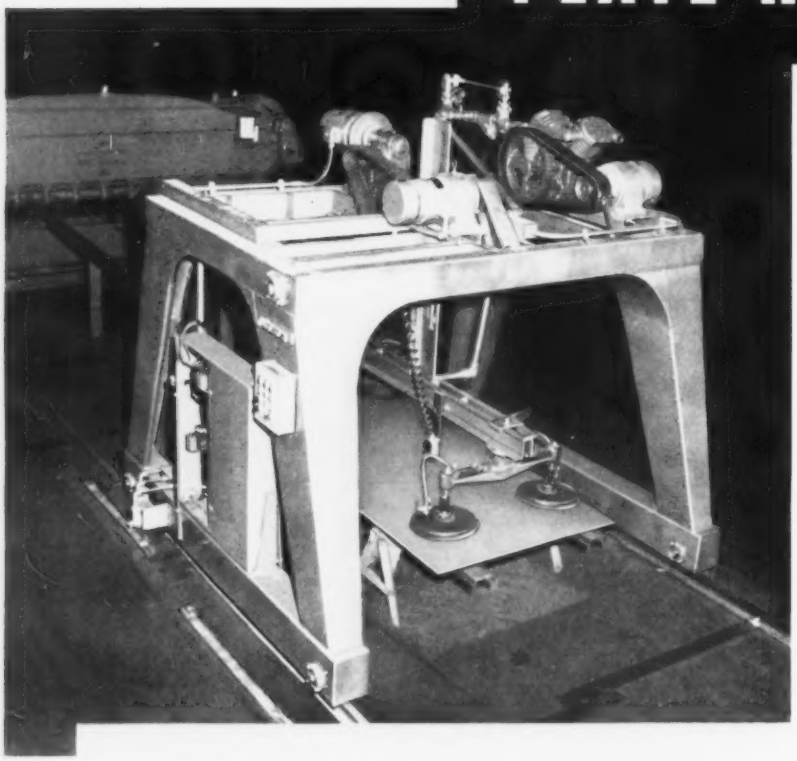
GULF®

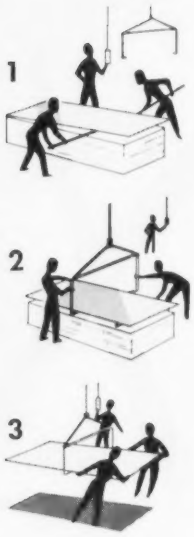
THE FINEST PETROLEUM PRODUCTS FOR ALL YOUR NEEDS

REPEAT ORDERS

–convincing evidence that it PAYS to use

NOBLE *Automatic* PLATE HANDLERS





Every firm which has purchased* a NOBLE automatic plate handler and has had the equipment in operation for more than three months has re-ordered. One is now installing the **eighth** unit!

This is mighty convincing proof that NOBLE equipment produces the expected increase in production at substantial cost reduction. It is also convincing evidence that NOBLE handlers are practical, reliable production equipment.

It will pay you to investigate NOBLE Automatic Handlers **now.** Available in standard capacities of 1,000, 2,000, 3,000 and 4,000 lbs., and in higher capacities and special designs to meet your requirements. Write or wire for details today; please address Dept. I-11.

*names on request

NO CREWS NEEDED to pry up plate, attach grabs, wrestle plate into position! At the touch of a button, your NOBLE handler picks up plate or sheet, raises and carries it, accurately positions and releases it on feed table, rolls, conveyor. Also re-stacks from machine, transfers from pile to conveyor, etc. Vacuum lift handles any type of flat material, without marring!

NOBLE COMPANY

P. O. Box 1979 • Oakland 4, California

typical large drill bit

Surface metal is cut away to shape drill point and spiral flutes — core is exposed to wear, structural loads

point and cutting lips are critical to drill performance. If alloy has any weakness at center, poor cutting or broken drill will result.

Mel-Trol eliminates this trouble by insuring uniform strength and toughness from surface core. Never before have commercially available alloys been so completely free of segregation, porosity and centerline weakness.

MEL-TROL ...solves a major metalworking problem—poor centerline quality in alloys

The more surface metal you cut away from an alloy steel bar, the more important uniform core quality becomes. The drill illustration above shows you why.

In alloy steels made by conventional steelmaking process, segregation, porosity or other inhomogeneities are often found along the centerline. Result: the core metal lacks the toughness of the rest of the bar, even though it may show no detectable variation.

To alleviate this major cause of poor tool quality, poor tool life and excessive rejects, Carpenter metallurgists developed the Mel-Trol process. Now, for the first time, alloys with complete uniformity from surface to centerline are being made in quantity.

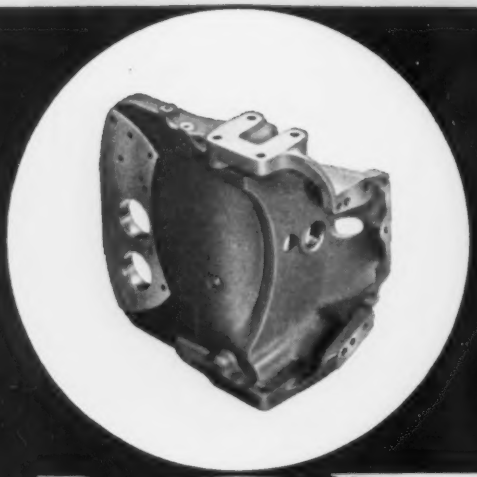
The Mel-Trol process produces freedom from segregation, porosity and centerline weakness through a system of quality controls which play a part in every phase of the entire steelmaking process. Equipment developed specifically for Carpenter is used together with the most modern standard quality control tools. Every piece of equipment is used to its highest accuracy—nothing less.

Mel-Trol alloys are now available at Carpenter mill-branch warehouses. Ask about them the next time a Carpenter representative calls on you. He'll show you how you can join the growing number of companies who are finding Mel-Trol alloys the answer to a host of metalworking problems.

Carpenter STEEL

The Carpenter Steel Company, 121 W. Bern St., Reading, Pa.
Export Dept.: The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"

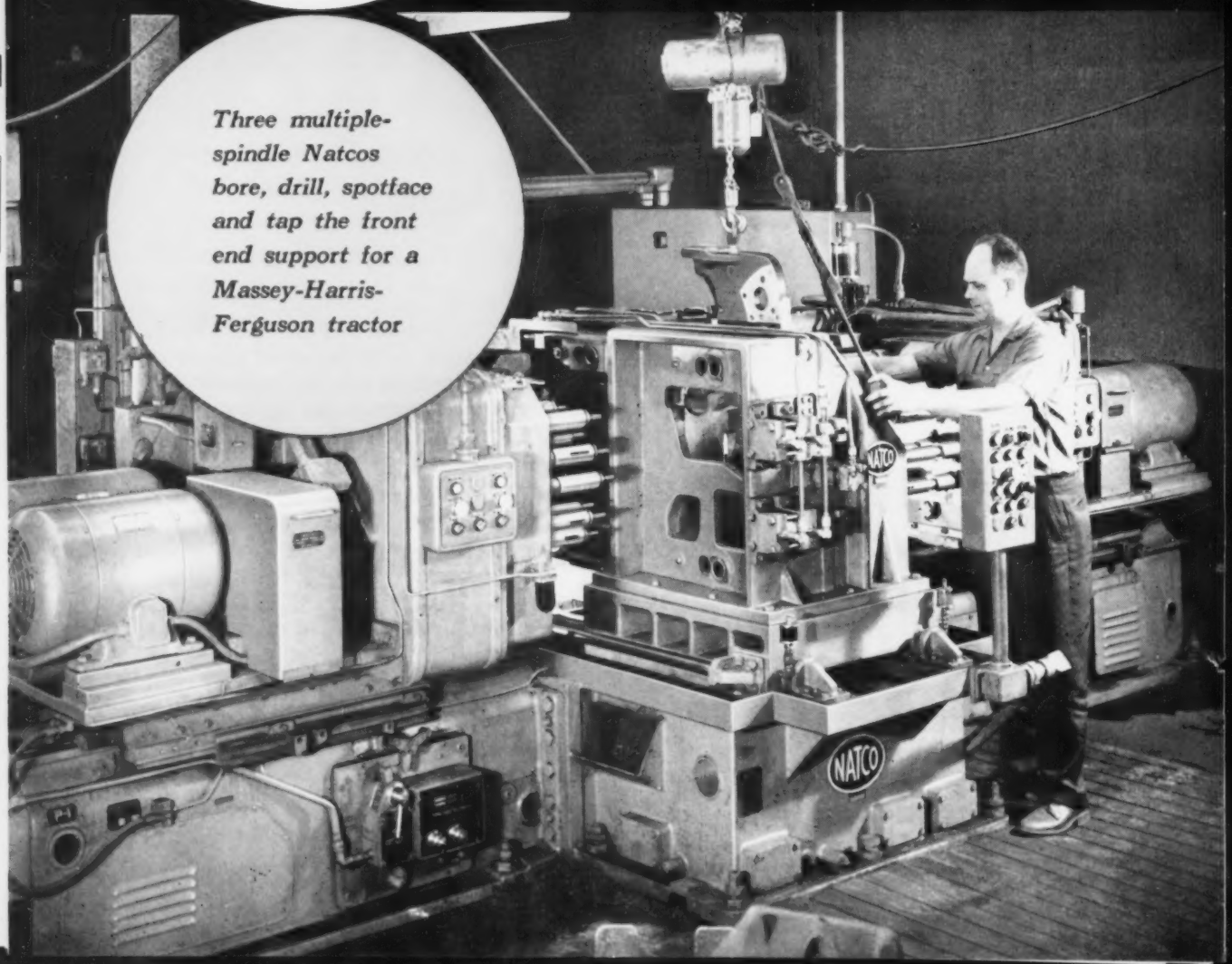
Pioneering in improved specialty steels through continuing research



At Massey-Harris-Ferguson

Natcos Save 100 Parts...

Three multiple-spindle Natcos bore, drill, spotface and tap the front end support for a Massey-Harris-Ferguson tractor



NATCO

60 Man Hours Every

on Rugged Axle Support Castings

Massey-Harris-Ferguson checked it two ways. Nine general-purpose machines would do the job—or 3 Natcos. They chose the Natcos for these reasons:

- *Saving of $30,000 in machine cost*
- *Saving of 60 man hours every 100 parts*
- *Saving of 65% in floor space*

The Natcos handle all drilling, boring, spotfacing and tapping—a total of 67 operations on the 182-pound front axle casting. The casting is heavy, irregular—tough to fixture and clamp. The Natcos meet production requirement of 11 parts per hour.

Natco provided complete tooling which features automatic clamping, cycling and chip blow-out. All three machines are of unitized construction, giving Massey-Harris-Ferguson the flexibility to run different parts of redesigns of the same part.

Let Natco Field Engineers point out cost-saving and time-saving methods on your next drilling, boring, facing or tapping job. Natco offices are located in Chicago, Detroit, New York, Buffalo, Boston, Philadelphia, Cleveland and Los Angeles; distributors in other cities.

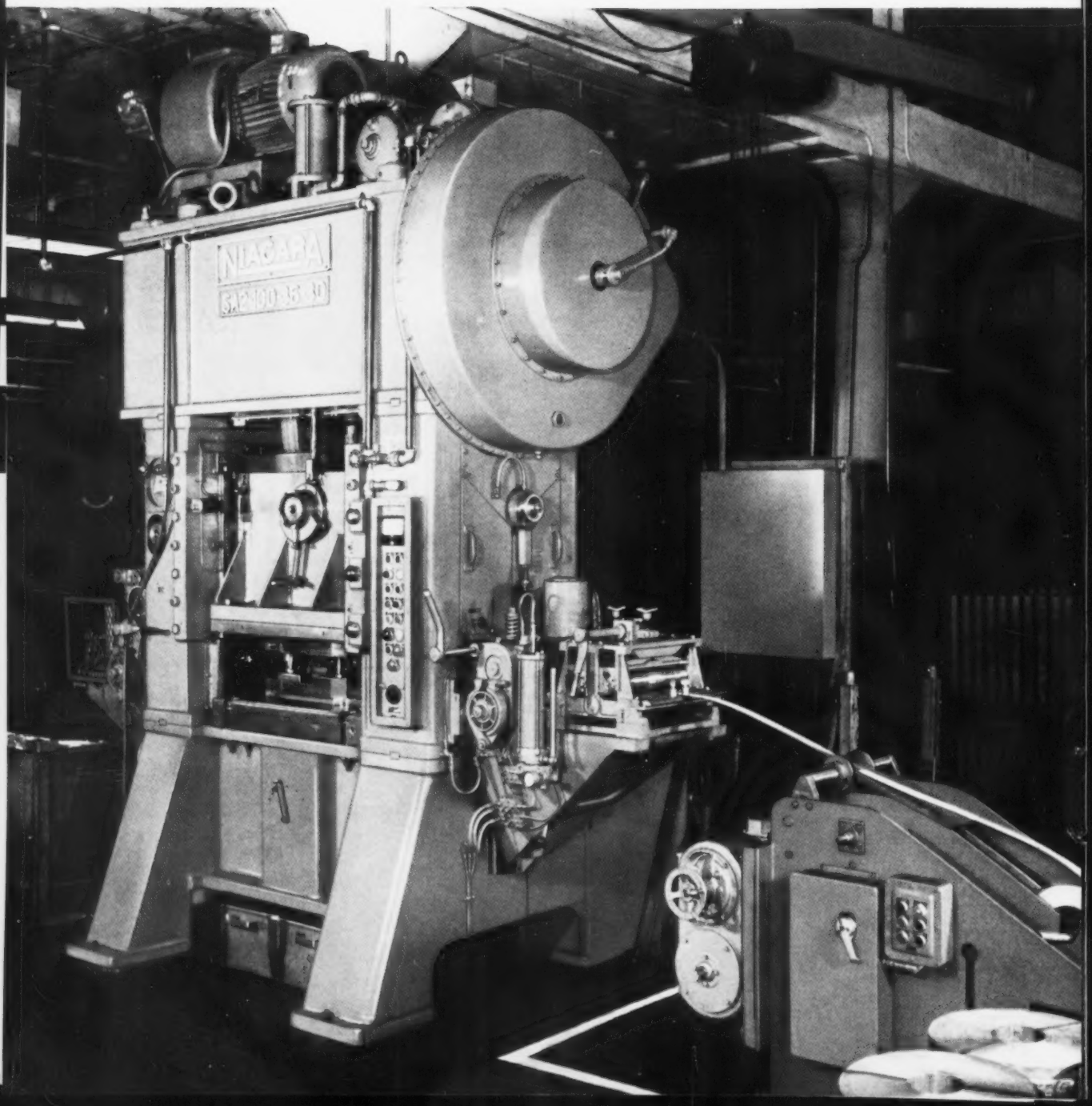
National Automatic Tool Company, Inc.

Richmond, Indiana

Multiple-spindle drilling, boring, facing and tapping machines. Special way-type, index and transfer machines.

Ready for you...

ALL-NEW



AUTOMATIC PRESS

to give you more stampings per hour at less cost...in long and short runs

Build your stamping profits to new heights the modern way: Automatically . . . with an all-new Niagara SA-2. Here's an up-to-the-minute press package that is distinctly different from anything heretofore available . . . complete with ultra-modern automatic feed, plus today's most advanced press mounted controls and devices, to bring you high speed stamping at its very best.

Brand new from crown to base, the Niagara Automatic boasts bonus features throughout . . . features that are unavailable on any other press in this category. Yes, *everything* is new about it, differing sharply from modified, adapted straight side presses of conventional design. Every square inch of its extra massive, rugged construction is *heavier . . . far heavier* for vibration-free, precision performance at high speeds:

KING SIZE CRANKSHAFT AND CRANKPINS — substantially larger than those on traditional straight side presses.

ENTIRE DRIVE IS HEAVIER — gears, electro pneumatic friction clutch, brake, flywheel and motor.

EXTRA BEARINGS — for better support of crankshaft, feed take-off and main gear (or flywheel).

MASSIVE, EXTRA HEAVY FRAME — all steel, 4-piece, tie rod, box type construction (bed, uprights and crown) built to absorb shock and vibration, and provide greater resistance to deflection. Up to 100% heavier than regular straight side press construction. Uprights extra wide to house electrical and circulating oil controls.

RIGID, EXTRA REINFORCED, BOX TYPE SLIDE remains in precise alignment with bed.

EXTRA LONG, SPECIAL SQUARE GIBS guide slide precisely.

LAMINATED, NON-METALLIC WAYS positively prevent welding or galling of bearing surfaces.

AUTOMATIC CIRCULATING OIL SYSTEM keeps all press bearing surfaces continuously lubricated.

ULTRA-MODERN AUTOMATIC FEED perfectly mated to press.

EXCLUSIVE NIAGARA MECHANICAL ROLL LIFTING SYSTEM — built into the press for independent, infinite adjustment of ingoing — outgoing rolls, from floor level.

OVERSIZE ADJUSTABLE AIR COUNTERBALANCE for smoother, safer press performance.

From start to finish, automatic stamping the Niagara SA-2 way, spells endless economies for you. It will pay you to investigate the facts *now*.

THE FULL STORY is unfolded for you, feature by feature, in new, illustrated Bulletin 264. Write for your copy today . . . then consult a Niagara representative.

NIAGARA MACHINE & TOOL WORKS, BUFFALO 11, N. Y.

DISTRICT OFFICES: Boston • Buffalo • Cleveland • Detroit • Indianapolis • New York • Philadelphia

Distributors in principal U. S. cities and major foreign countries

NIAGARA

SERIES SA-2, TWO-POINT STRAIGHT SIDE PRESSES

SHAFT DIAMETERS: 4½-9 INCHES • CAPACITIES: 60-300 TONS

America's most complete line of presses, press brakes, shears, other machines and tools for plate and sheet metal work

Got a broaching problem?

You may need the machinability and toughness of **REX M-2-S** high speed steel for your broaches. Call your Crucible warehouse.

Find it's a tough job to get accurate tooth radii, heights and lands in your broaches? And that the accuracy doesn't last because the tool steel isn't sufficiently wear-resistant?

Call your Crucible warehouse. They'll recommend Rex® M-2-S, a sulphurized modification of Crucible's Rex M-2 High Speed Steel. This steel provides an improvement in machinability of about 25 to 35% under normal conditions. It has red hardness equal to 18-4-1, yet costs substantially less and offers superior wear resistance and toughness. Try it! You'll get longer use from broaches, drills, chasers, milling cutters and even hack saw blades.

Rex M-2-S is only one of the dozens of special purpose steels stocked in the sizes and shapes you need at nearby Crucible warehouses. And remember:

Crucible is the only specialty steel producer *fully integrated to the point of use.* That means control and responsibility from raw material to warehouse delivery to you.

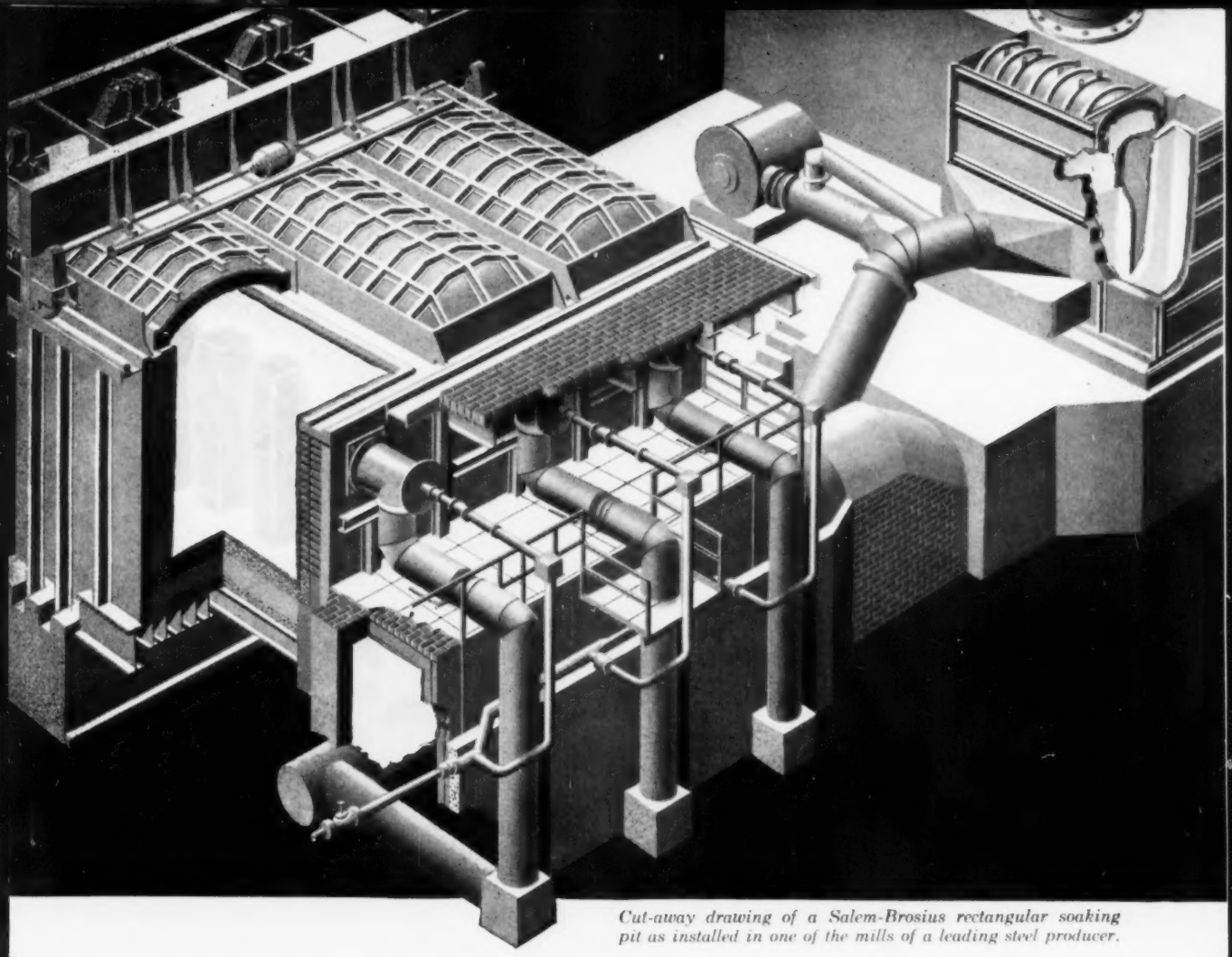
STOCKS MAINTAINED OF:

Rex High Speed Steel . . . ALL grades of Tool Steel (including Die Casting Die and Plastic Mold Steel, Drill Rod, Tool Bits, and Hollow Tool Steel Bars) . . . Stainless Steel (Sheets, Bars, Wire, Billets, Electrodes) . . . Max-el, Hy-Tuf, AISI Alloy . . . Onyx Spring, Hollow Drill Steel and other special purpose steels.

CRUCIBLE WAREHOUSE SERVICE

Crucible Steel Company of America

General Sales Offices: The Oliver Building, Mellon Square, Pittsburgh 22, Pa. Branch Offices and Warehouses: Atlanta • Baltimore • Boston • Buffalo • Charlotte • Chicago • Cincinnati • Cleveland • Dallas • Dayton • Denver • Detroit • Grand Rapids • Harrison • Houston • Indianapolis • Los Angeles • Milwaukee • New Haven • New York • Philadelphia • Pittsburgh • Portland, Ore. • Providence • Rockford • San Francisco • Seattle • Springfield, Mass. • St. Louis • St. Paul • Syracuse • Toronto, Ont.



Cut-away drawing of a Salem-Brosius rectangular soaking pit as installed in one of the mills of a leading steel producer.

Users are the best salesmen of Salem-Brosius soaking pits

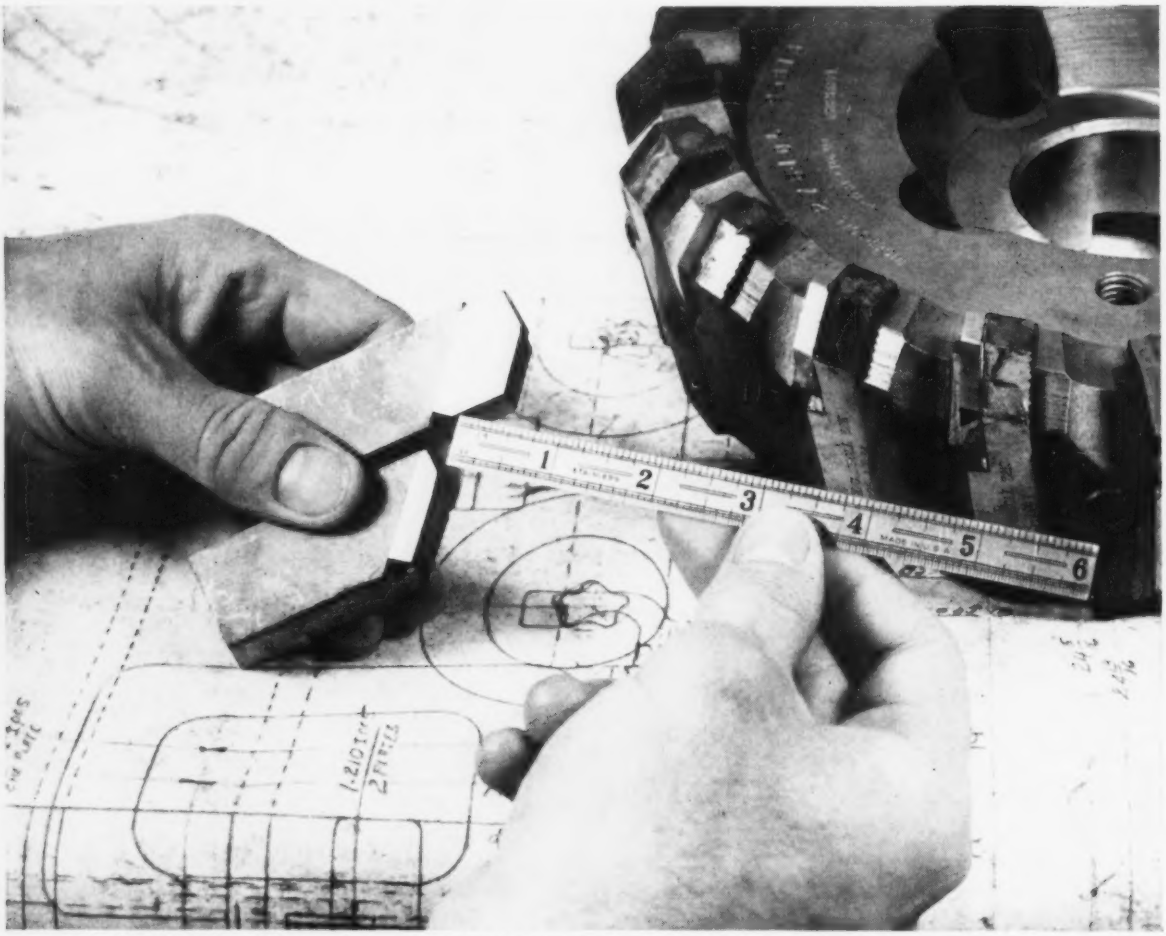
"We have again specified Salem-Brosius rectangular soaking pits for our expansion program," reports an operating official of a major steel company using pits installed by several manufacturers. "The previous installation heated more steel ingots ready for rolling with less fuel consumption, less maintenance cost, and better temperature uniformity than any other type of pit in our plant."

Reports like this are typical, not only about these rectangular soaking pits, but all other Salem-Brosius heating and heat-treating furnaces as well. Salem-Brosius engineers, both here and abroad, possess an enviable record for designing furnaces which produce maximum, high-quality output at minimum operating cost. If your expansion or modernization plans call for ingot soaking pits or any other heating or heat-treating furnaces, Salem-Brosius, Inc. would appreciate an inquiry.

SALEM-BROSIUS, INC.

CARNEGIE, PENNSYLVANIA

In Canada: Salem Engineering Limited, 1525 Bloor Street West, Toronto, Ontario



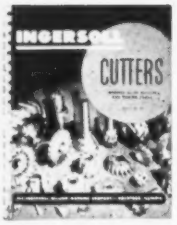
Ingersoll Heavy-Duty Shear Clear Face Mill designed for cast iron or steel. Size of bevel is varied to suit depth of stock.

What Does Your Scrap Barrel Show?

Do you get over $\frac{1}{2}$" of blade wear? A look into your scrap barrel will show that many blades were wasted because of cracks, misuse, improper design or misapplication of the cutter and grade of carbide. You probably can't tell why these blades failed prematurely because so many variables are involved.

We are used to working with these variables and can help you reduce your tool costs. Part of our product is the continuous counsel of your Ingersoll representative and our cutter engineers. They will consider the machine, material, speed, feed and finish requirements before recommending the tool which will do the best job at the lowest cost.

We will welcome an opportunity to tell you more about this service. Write:



If you do not have a copy of this book, write us and we will send you one. It describes in detail the complete line of Ingersoll inserted blade milling and boring tools. Ask for Catalog #66N

CUTTER DIVISION

THE INGERSOLL MILLING MACHINE COMPANY

505 FULTON AVENUE ROCKFORD, ILLINOIS

NOW

98% pure fused Vanadium Oxide... immediate delivery ...low price

Previously, fused Vanadium Oxide was produced to purity specifications of only 86 to 89%. Now, advanced production techniques make it possible for ELECTROMET to provide it at 98% purity—at no increase in price.

This new grade of vanadium oxide provides these properties for ferrous and non-ferrous alloy uses:

- **Low alkali oxide content virtually eliminates fuming problems.**
- **Insolubles content—mainly silica—reduced to new low insuring manufacture of higher quality non-ferrous alloys.**

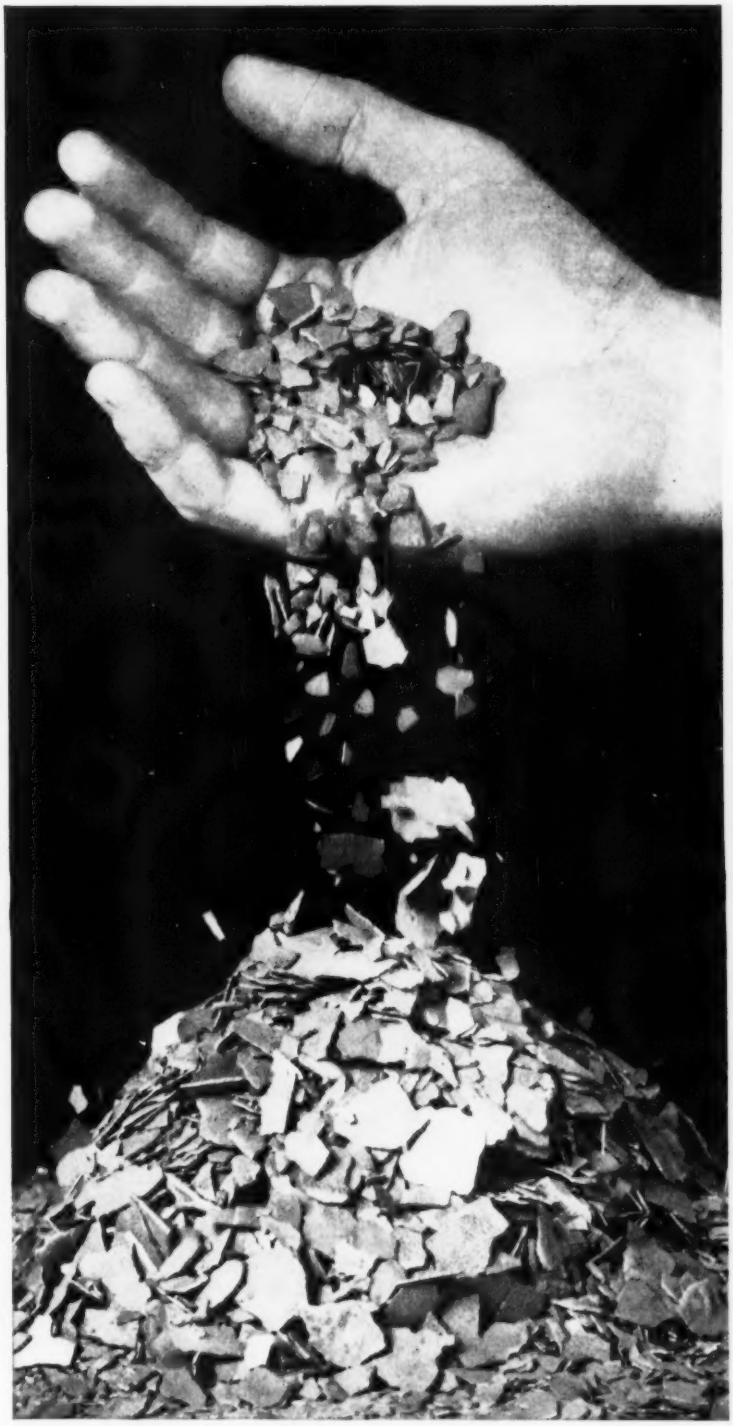
For more information write ELECTRO METALLURGICAL COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y.

In Canada: Electro Metallurgical Company, Division of Union Carbide Canada Limited, Toronto.

METALS DO MORE ALL THE TIME ... THANKS TO ALLOYS

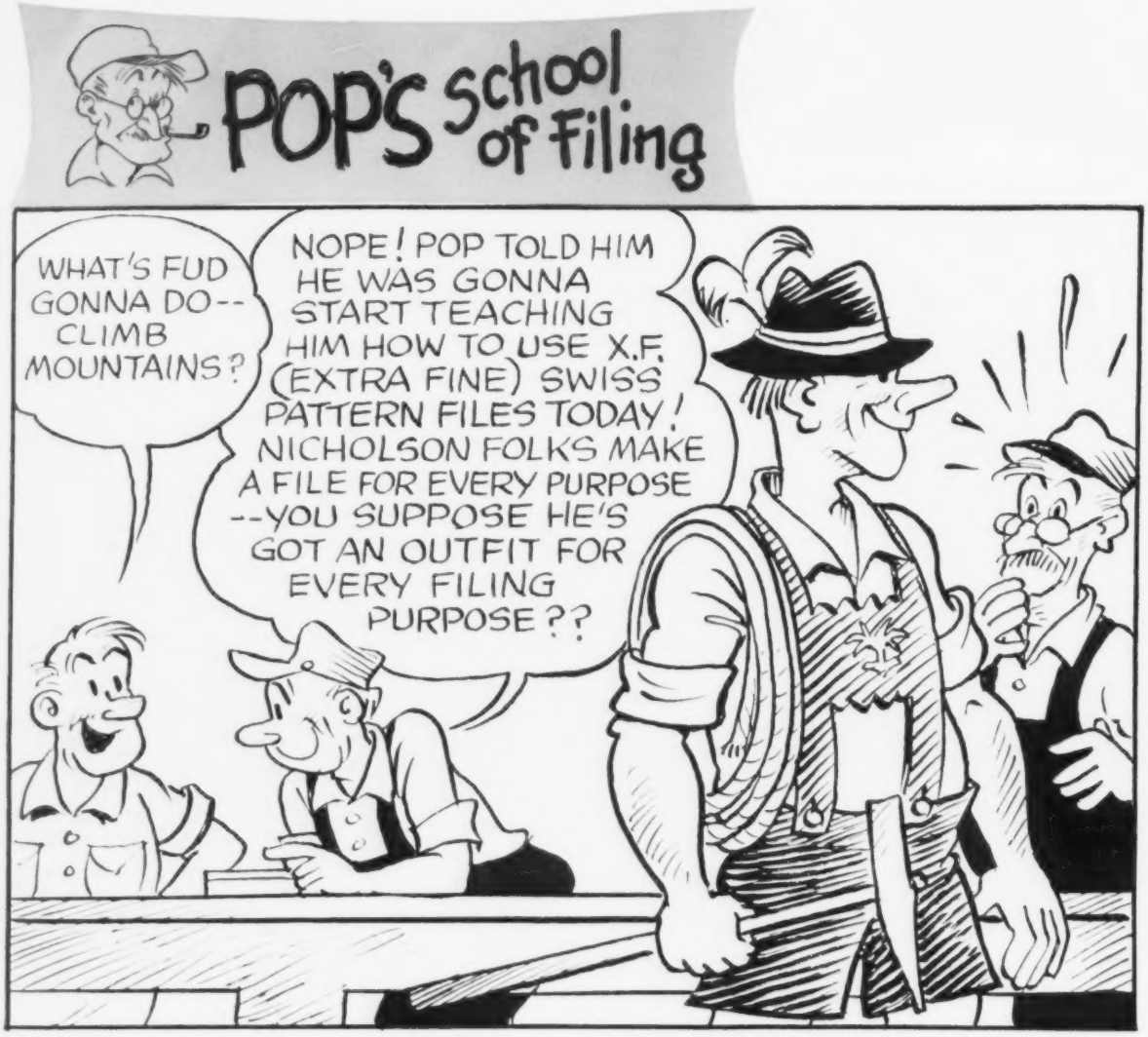
Electromet
FERRO-ALLOYS AND METALS

UNION CARBIDE



Analysis: Vanadium Oxide 98%, Alkali Oxides 1-2%, Sulfur 0.05% Max., Insolubles 0.2% Max.

• The terms "Electromet" and "Union Carbide" are registered trade-marks of Union Carbide Corporation.


POP'S school of filing
WHAT'S FUD GONNA DO-- CLIMB MOUNTAINS?
NOPE! POP TOLD HIM HE WAS GONNA START TEACHING HIM HOW TO USE X.F. (EXTRA FINE) SWISS PATTERN FILES TODAY! NICHOLSON FOLKS MAKE A FILE FOR EVERY PURPOSE --YOU SUPPOSE HE'S GOT AN OUTFIT FOR EVERY FILING PURPOSE??

For precision filing and fine work, Fud can forget the leather outfit—and simply equip himself with the proper Nicholson X.F. Swiss Pattern files.

These precision files are made to extremely tight tolerances. And Nicholson makes hundreds of types so that anyone who needs a Swiss Pattern file can get exactly the type he needs with outstanding Nicholson quality.

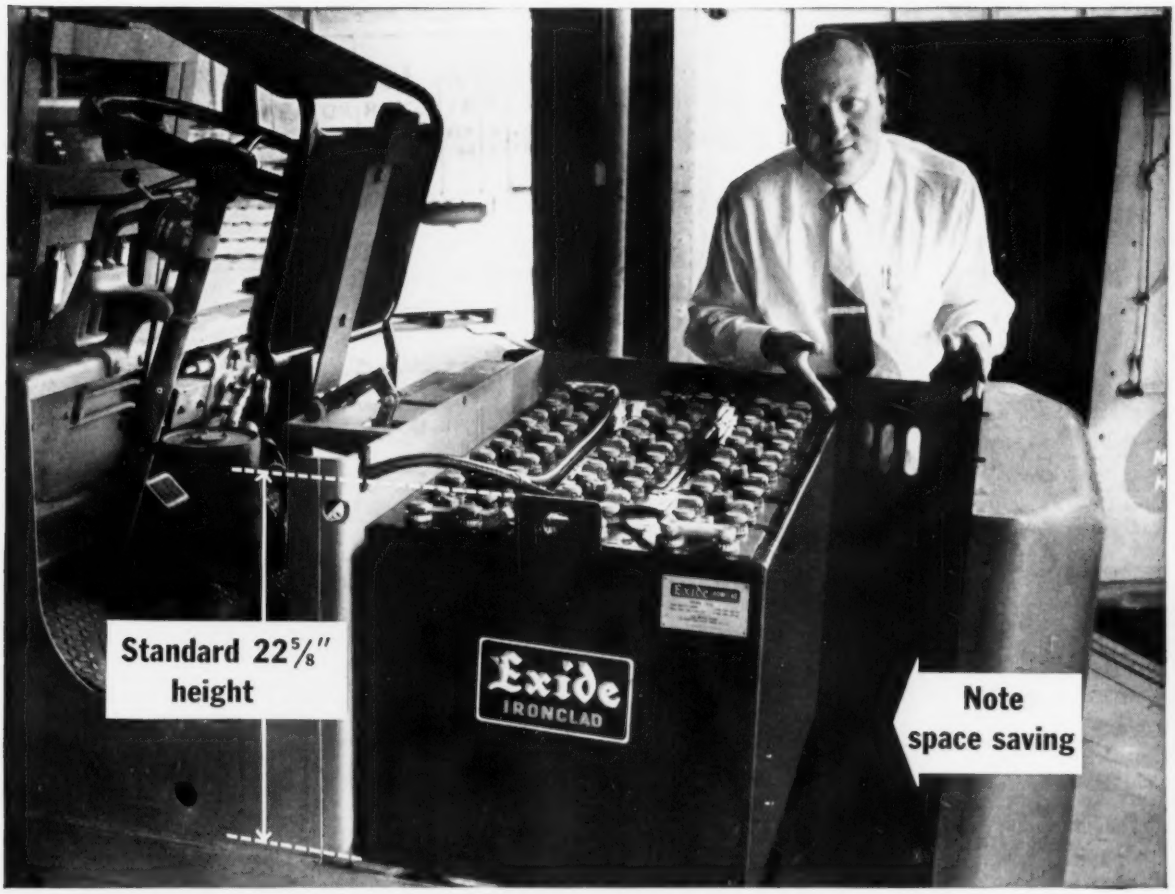
Nicholson X.F. Swiss Pattern files have the same general shapes as American Pattern files, but you will find them thinner and more finely shaped. You can get Nicholson X.F. Swiss Pattern files in seven degrees of fineness, instead of the usual three for American Pattern files.

Your Industrial Distributor has full stocks of X.F. Swiss Pattern files. He'll serve you promptly.

NICHOLSON FILE COMPANY, PROVIDENCE, RHODE ISLAND

(In Canada: Nicholson File Company of Canada Ltd., Port Hope, Ontario)

NICHOLSON FILES *A FILE FOR EVERY PURPOSE*



Greater flexibility. A 5000 lb. capacity truck with a 648 amp-hr new TG Exide-Ironclad battery. Same truck could hold a 936 amp-hr battery for increased work capacity if needed. Or the 648 amp-hr battery could also be used on a truck as small as 2000 lb. capacity. This flexibility is possible only with Exide's exclusive new TG battery.

NEW TG EXIDE-IRONCLAD BATTERY PACKS SAME POWER IN SMALLER SIZE FOR LOWER COST

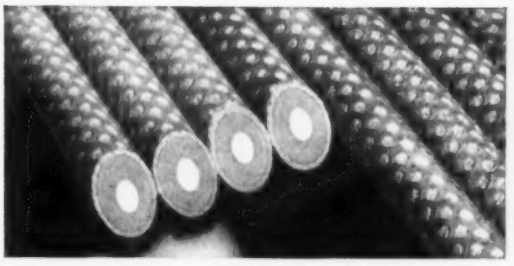
Improved design gives more power and life per dollar. Superior peak-load performance.

Here's the kind of battery economy that really counts: more power and life per dollar. The TG Exide-Ironclad is the most advanced and economical battery ever built for electric industrial trucks.

Every plate packs more power; fewer plates are required to perform a given duty cycle. That means you get a more compact battery with the *standard 22⅝ in. height*. It also means that, for a given capacity, the new TG costs you less. TG's armored porous tubing prevents practically any loss of active material; so even greater economy is gained as a result of its long, dependable service life.

More work from your trucks. The compactness of the TG means you can install more power in your trucks—thus, get more work from them. For a given size truck, TG can give you up to 44% more power than batteries you might otherwise use.

Only Exide offers you so much. When you order new batteries, get all the power, performance and life your dollar can buy. Get TG EXIDE-IRONCLAD. For full particulars about the extra productivity and longer life of the new battery, call your EXIDE Sales Engineer, or write Exide Industrial Division, The Electric Storage Battery Company, Philadelphia 2, Pa.



New, more porous armored tubing for positive plate. Eases current flow. Holds more active material. Boosts battery power. Corrosion resistant Silvium* grid insures long plate life.

*Exide's patented grid alloy

Exide®
THE ELECTRIC STORAGE BATTERY COMPANY

If Corrosion is a factor, consider TI-COR galvanized

BLACKHAWK ACE FAILS TO FLAKE TI-CO®

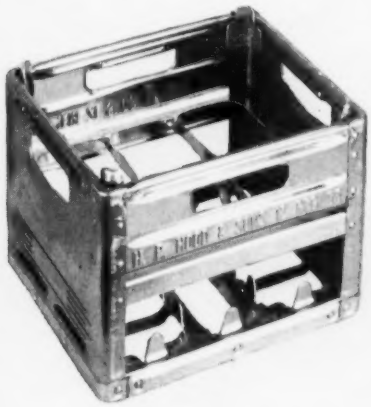
Captain Gus Mortson of the Chicago Blackhawks examines sheet of TI-CO after driving frozen puck into it. Plenty of dents but no evidence of flaking.

Gus Mortson, Captain of the famous Chicago Blackhawks, used his hardest driving shot in slamming a frozen puck into a sheet of Inland TI-CO galvanized steel. Time after time, at speeds up to 100 m.p.h., the puck banged into the sheet but the zinc coating on TI-CO stayed put . . . not a sign of flaking. This brutal test illustrates how TI-CO can take it—even when subjected to far rougher treatment than encountered in normal use. Further proof that TI-CO can withstand even the most severe fabricating operations or the toughest handling and still retain its protective zinc coating. No chance for rust to get a foothold.

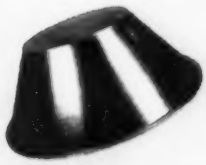
If Corrosion is a factor, consider TI-CO galvanized sheets when designing or redesigning

Before the development of the Sendzimir continuous galvanizing process, it was impractical to use galvanized sheets for many products that required severe fabricating. The zinc coating applied by the old pot-dipped method flaked excessively making costly redipping necessary.

Today, any product that can be made with cold rolled steel can be made with TI-CO. Whether it requires deep drawing, stamping, bending, crimping, lock-seaming or even spin-drawing, TI-CO takes them all in stride. The zinc coating stays put providing over-all protection against corrosion.



Milk cases must take heavy daily abuse and corrosive action of frequent contact with water during the milk cooling process. The manufacturer of this case, looking for a less expensive material than he was presently using, and one that would be stronger and still retain desired corrosion resistance, decided to try Inland TI-CO Galvanized Sheets. He was surprised and pleased to find that TI-CO performed beautifully, even when making the corner locking ears of the cases . . . a part requiring a concentrated, severe draw. In their early tests, the company subjected corner locking ears made of TI-CO to 200 hours in the salt spray cabinet. TI-CO stood the test perfectly, not a sign of corrosion.



For years the manufacturer of this hog waterer made the tank with straight sides, soldered at the joints. They needed the corrosion resistance of galvanized sheets but available pot-dipped sheets could not take the required draw of a one-piece design without excessive flaking of the zinc coating. Then they learned about Inland TI-CO. Today, they spin-draw the tanks and covers for their waterers from TI-CO. Their production costs have dropped 40% (a reduction in soldering of 30% alone). They have a product greatly improved in appearance and durability too.

TI-CO Galvanized Sheets are readily available!

The terrific demand for this high quality sheet has kept TI-CO in short supply since its development. Now, additional production facilities have been completed making greater quantities available.

TI-CO is available in cut sheets or coils, in gages 8 to 30 inclusive and widths as great as 60 inches. TI-CO comes with dry, oiled or chemically treated surfaces. Consult your Inland representative for your needs.

If you are presently manufacturing or designing a product in which corrosion is a factor, it will pay you to investigate TI-CO galvanized sheets.

Write today for a free informative booklet on TI-CO to:

INLAND STEEL COMPANY

38 South Dearborn Street • Chicago 3, Illinois

Sales Offices: Chicago • Milwaukee • St. Paul • Davenport St. Louis • Kansas City • Indianapolis • Detroit • New York

INLAND TI-CO ®

look for this brand—
your assurance of
non-flaking performance

Cuts die-grinding time 20%

WITH ROTOR'S 40,000 RPM BLADED TYPE TOOL

JOB: Die grinding. Formerly used bulky turbine type air grinders. Power dropped under load. Switched to Rotor D-03 Pencil Air Grinder.

RESULTS: Bladed type motor of Rotor D-03 cut job time 20% because of its ability to deliver higher speed under load. Tool paid for itself in 8 weeks. Also, tool is lighter, more compact . . . easier to handle, more versatile. Full details in Bulletin 42A.

Have a Rotor Application Engineer study all of your portable tool operations for possible savings. No obligation.

ROTOR TOOLS
CLEVELAND, OHIO

Here's the RIGHT TOOL for YOUR job!

Rotor Air Tools: Assembly Tools • Drills • Small Wheel Grinders
Straight Grinders • Vertical Grinders • Scalers • Chippers • Rammers
Rotor High-Cycle Electric Tools: Grinders • Polishers • Sanders

meet Jenny . . . the girl with the magic touch

HOW DO YOUR CLEANING COSTS STACK UP AGAINST JENNY'S ?

40-Ton Toggle Press	3 Hours
Automatic Screw Machine	5 Hours
Steel Mill Windows, per 30 panes	15 Minutes
Garage Floors, per 30 sq. ft.	10 Minutes
Machine Shop Floors, per 15 sq. ft.	15 Minutes
8-Ton Woodworking Machine	2 Hours
Overhead Crane Rail Girders, per 6 ft. section	15 Minutes
Pipe Threading Machine	30 Minutes
Small Drill Press	20 Minutes
Railroad Tank Car	2 Hours

Jenny® SERIES 1800 STEAM CLEANER

Maintenance superintendents report that Hypressure Jenny cuts cleaning time to one-tenth the time required by ordinary methods. Reduces down-time to a minimum. Regardless of how large or how small your cleaning job, there is a Hypressure Jenny to fit your requirements. In addition, the revolutionary Jenolizing process prevents rust after steam cleaning. Write for details now.

SERIES 1800 . . . one of 80 different models and types.

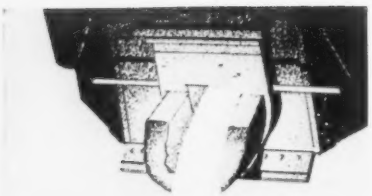
Please send me information on "How Industry Gets More Productive Hours" with Hypressure Jenny Steam Cleaners. 23

Name_____

Street_____

City_____ Zone____ State_____

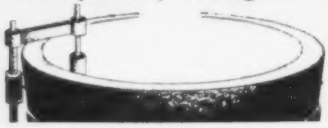
HOMESTEAD VALVE MANUFACTURING COMPANY
Hypressure Jenny Division • Coraopolis, Pennsylvania



Alloy Steel Toughness

RESISTS

Heavy-Duty Roughness



Landing-gear strut for the North American F-100C is manufactured by Bendix Products Division, Bendix Aviation Corporation. Exacting requirements for inner and outer cylinders resulted in the development of a new grade of steel by Bendix and Republic metallurgists working in cooperation with North American engineers.

How Metallurgical Teamwork Developed the Super Sabre's Tough,

When a new grade of steel is born, there's sure to be an interesting story behind it.

In this case, it's the story of close cooperation between metallurgical teams from Bendix and Republic. Their common goal: development of a tough, strong, alloy steel to withstand the shock, impact, strain and vibration of tons of aircraft hitting the runway at speeds in excess of 100 miles per hour.

It starts after World War II, when Bendix metallurgists undertook a program to correct certain characteristics and improve processing deficiencies of steels commonly used for aircraft landing gear.

Several leading steel companies, including Republic, were consulted and the program outlined. Republic immediately put its 3-Dimension Metallurgical Service Team on the problem.

The field metallurgist worked closely with Bendix metallurgists and engineers right in their own plant under actual operating conditions. Their findings were supplemented and coordinated by the other two members of the Republic team—the laboratory and mill metallurgists.

The result: development of a new grade of steel that

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

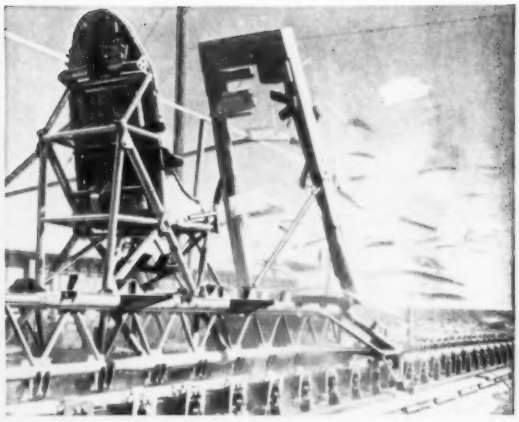
Strong, Alloy Steel Landing Gear

was found ideal for application in the strength range of 220,000-240,000 psi. This steel, designated AMS 6427 by the SAE, offers maximum resistance to fatigue. Provides an exceptionally high strength-to-weight ratio. Maintains its great strength at wide temperature extremes. Responds uniformly to heat-treatment, producing hard, wear-resistant surfaces around tough cores.

Are you sure you are using the right steel? Why not make sure by using Republic's 3-D Metallurgical Service to assist you in a check-up? It's confidential. There's no obligation. Just send us the coupon.

STEEL

and Steel Products



WHERE STRENGTH IS AN IMPORTANT REQUIREMENT— such as this rocket sled for deceleration tests—manufacturers choose tubing for basic construction. At any given weight, tubing is strongest of all mechanical shapes . . . as a beam . . . in torsion . . . under compressive loads. Republic ELECTRUNITE® Steel Mechanical Tubing, the original electric resistance welded tube is well known for quality and performance. It's available in carbon and stainless steel in a wide variety of sizes, shapes and gages. Send coupon for more facts.

HIGH STRENGTH AND LIGHTWEIGHT ADVANTAGES of Republic Titanium are adding range, speed and maneuverability to both military and commercial aircraft. In the Navy's HOK-1, sections fabricated from Republic Titanium, Type RS-70 Annealed are used as the firewall between pilot and engine compartments. But, titanium should not be looked upon as strictly an aircraft or military metal. Its extremely high resistance to most forms of corrosion makes it attractive for use in processing and chemical equipment, heat exchangers, dehydration trays, anodizing racks, etc. Mail coupon for more information.

REPUBLIC STEEL CORPORATION
Dept. C-2828 R
3104 East 45th Street, Cleveland 27, Ohio

☐ Have an Alloy Metallurgist call.

Send more information on:
☐ ELECTRUNITE Mechanical Tubing ☐ Titanium

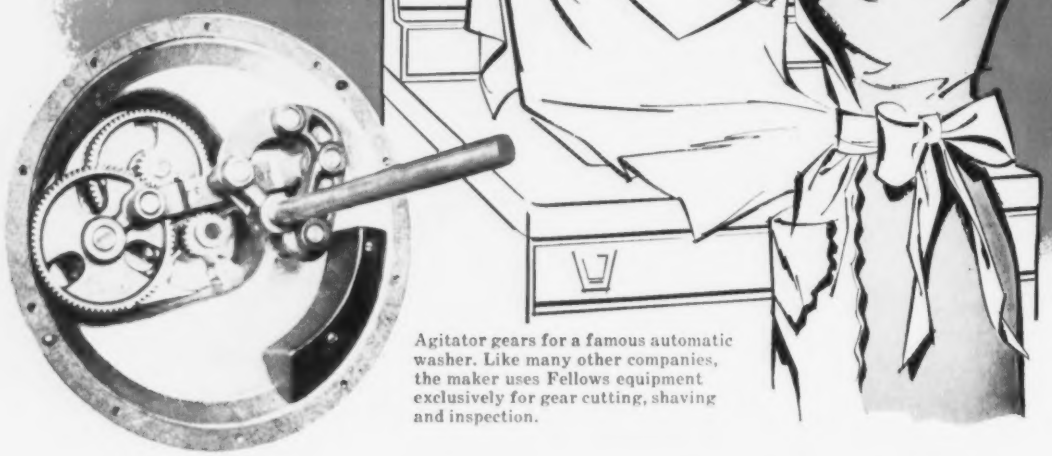
Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

GEARED to make "Monday morning" a breeze!



Agitator gears for a famous automatic washer. Like many other companies, the maker uses Fellows equipment exclusively for gear cutting, shaving and inspection.

Consider that modern marvel, the washing machine! It may handle *unbalanced* loads of 75-pounds of clothes and water... but it keeps working efficiently and quietly day after day, year after year. Yet it costs so little nearly everyone can own one.

The use of gears cut on Fellows Gear Shapers is one of the important factors contributing to the long-time, trouble-free service today's washers give. These gears must be of high quality and production cost must be low. Many makers of washers and other major appliances meet these requirements for accuracy and economy by cutting their gears—and other shapes—on modern Fellows Production Equipment.

Your own gear cutting needs, from 1/16" to 120" P.D., can probably be met more profitably and efficiently with Fellows Gear Production and Inspection equipment. Why not get full information? Write, wire, or phone any Fellows office.

THE FELLOWS GEAR SHAPER COMPANY
78 River Street, Springfield, Vermont
Branch Offices:
1048 North Woodward Ave., Royal Oak, Mich.
150 West Pleasant Ave., Maywood, N. J.
5835 West North Avenue, Chicago 39
6214 West Manchester Ave., Los Angeles 45

THE PRECISION LINE

Fellows *Gear Production Equipment*

CALL CRUCIBLE FOR UNIFORM-QUALITY STAINLESS STRIP

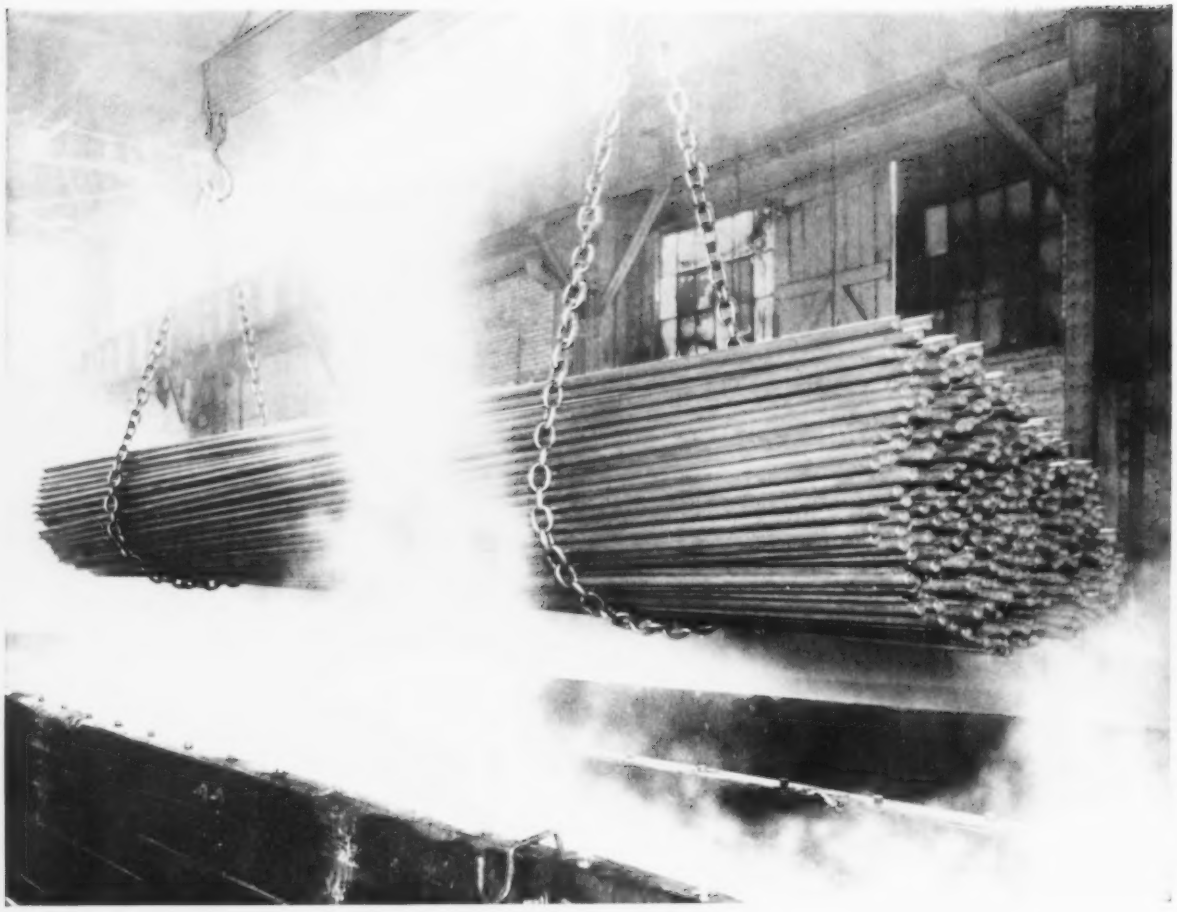
Crucible offers you dependable, fast delivery of stainless strip in every standard grade—precision-rolled to your specifications. Every coil comes to you with a finish that is unsurpassed . . . and with uniform quality that ensures easy workability.

Remember: You always get the most dependable quality and service from Crucible because Crucible's operations are fully integrated from raw material to delivery to you. *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

Canadian Distributor — Railway & Power Engineering Corp., Ltd.



No snap...

That's one reason why Wheatland prefers Monel chains for pickling steel pipe and tubing

Wrought Monel* chain links "give" a little when heavily overloaded . . . "telegraph" trouble by noticeable stretch *before* costly accidents occur.

This holds even after years of use in pickling solutions. Unlike other pickling fixture metals, there is no *hidden* weakening from corrosion. The metal you see is the metal you *have* to swing the load. At any time a pair of calipers gives you a good practical estimate of the load bearing capacity of the links.

Many pickling room operators consider this reason enough to prefer wrought Monel alloy chains. No unwelcome surprises! But there are many other advantages.

The chains shown above, for example, already have 5 years service behind them pickling pipe and tubing in 8-10% sulfuric acid at 140 F. at Wheatland Tube Co., Wheatland, Pa. As you can see, there is maybe as much service again left in them. Many plants report ten years and longer life, for Monel alloy pickling slings.

To long life, add weight-saving . . . (about 20% over cast chain) and ready repairability by welding.

No wonder Monel alloy is so widely used in pickling. Not only for sling chains. For tank tie-rods and nails . . . for pickle pins, eyebars, pipes, baskets, separators . . . for hairpin hooks . . . for crates . . . for cradles . . . for lift bars . . . many more.

All these devices and many pickling installations are pictured and described in the 32-page Inco booklet, "Equipping the Pickle House for Greater Production at Lower Cost." We'll be glad to send you this informative book. Just write for your copy.

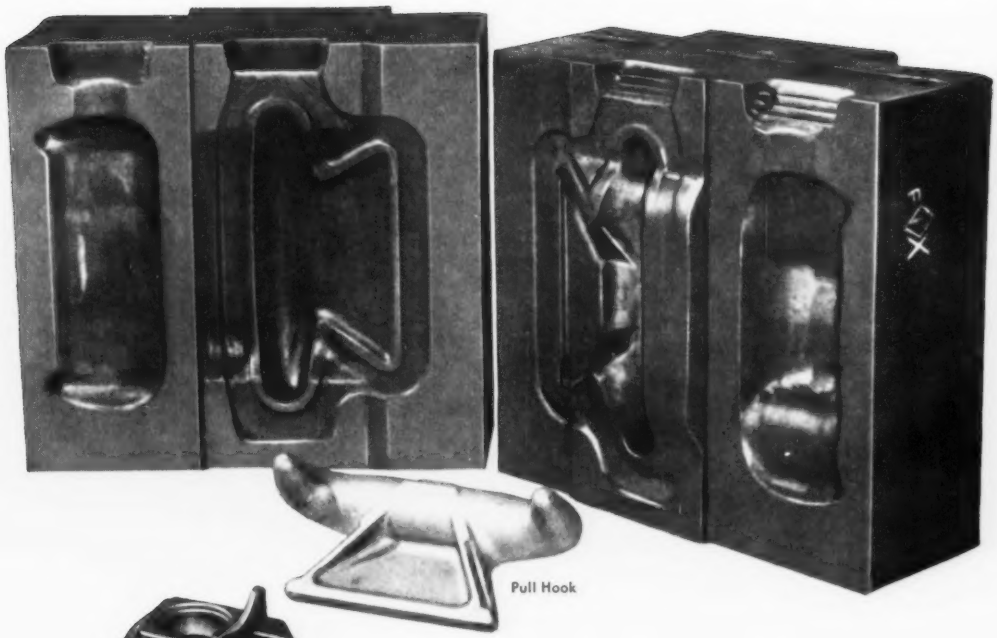
*Registered Trademark

The International Nickel Company, Inc.

67 Wall Street New York 5, N. Y.

INCO Nickel Alloys

Monel... *for proved pickling life*



USE FINKL DIE BLOCKS FOR QUALITY FORGINGS...

farm equipment manufacturers do!

International Harvester Company's Tractor Works, for one, uses Finkl die blocks to produce numerous tractor parts such as the pivot shaft bracket, pull hook, track link, equalizer spring saddle, and draw bar bracket shown on this page.

Because of the high volume production of these Crawler Tractor parts, Finkl FX die blocks are used at Harvester's Tractor Works to produce more forgings per sinking, and more sinkings per die. The special machining quality reduces die sinking time, without impairing the heat or wear resistance of the dies in production.

Finkl die blocks are available in several grades, all sizes, and tempers to handle virtually any forging requirement. Call your local Finkl representative next time you are considering die blocks or forgings. He will be glad to help you and there is no obligation.

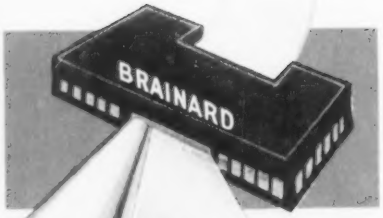
DIE BLOCKS · FORGINGS · HOT WORK STEELS · ELECTRIC FURNACE STEELS

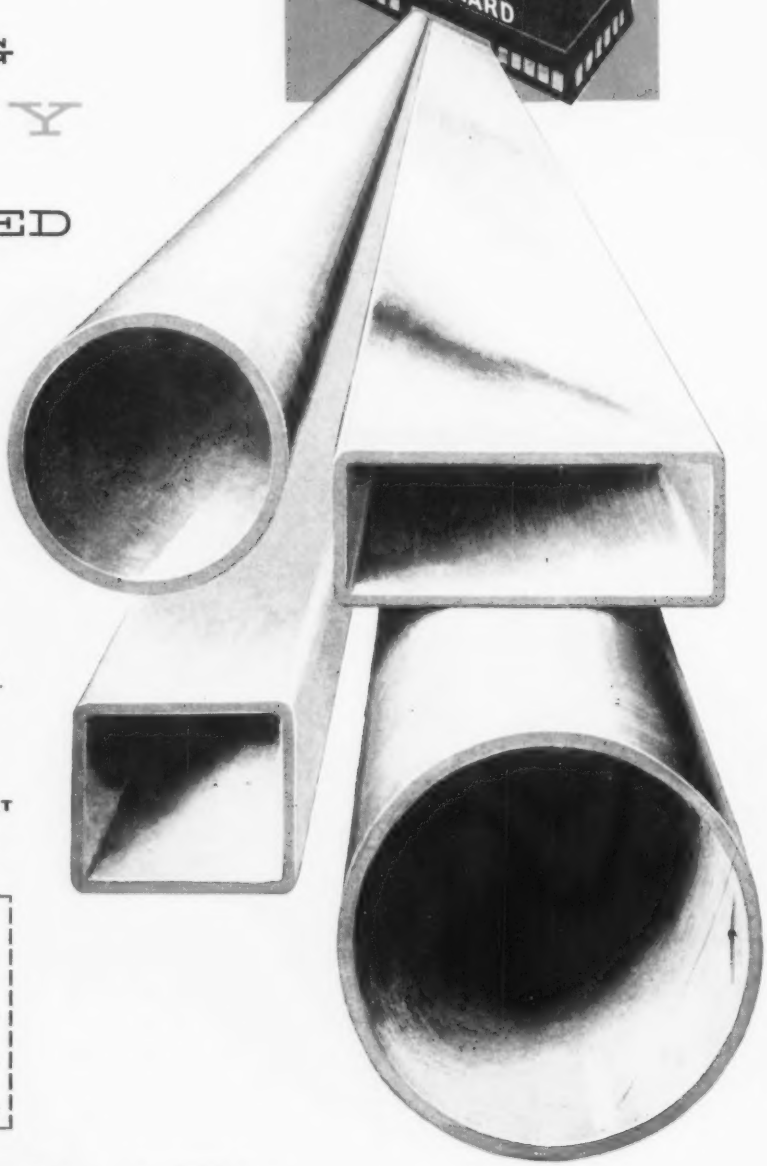
A. Finkl & Sons Co.

2011 SOUTHPORT AVE · CHICAGO 14, ILLINOIS

Offices in: DETROIT · CLEVELAND · PITTSBURGH · INDIANAPOLIS · HOUSTON · ALLENTOWN · ST. PAUL
COLORADO SPRINGS · SAN FRANCISCO · SEATTLE · BIRMINGHAM · KANSAS CITY
Warehouses in: CHICAGO · DETROIT · BOSTON · LOS ANGELES

IN BRAINARD STEEL TUBING QUALITY IS ASSURED





As a division of Sharon Steel, Brainard can be sure the steel used for the fabrication of tubing has been developed to meet their own exacting standards. From mine to finished product, Brainard Welded Steel Tubing has the extra quality that can come only from an integrated industry.

Brainard Electric Welded Steel Tubing, from ½″ to 4″ in diameter, is also available in squares, rectangles and many special shapes. Brainard Tubing can be furnished swedged, pressure tested, or fabricated.

For mechanical welded steel tubing of top value, buy Brainard.

SEND FOR THIS BOOKLET
For complete information on Brainard's Mechanical Welded Tubing.

BRAINARD STEEL TUBING
Griswold St., Warren, Ohio

Name _____

Address _____

City _____ Zone ___ State ___

Brainard Steel Tubing

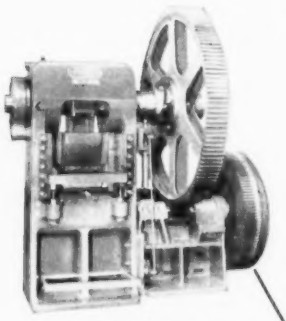
SHARONSTEEL

400

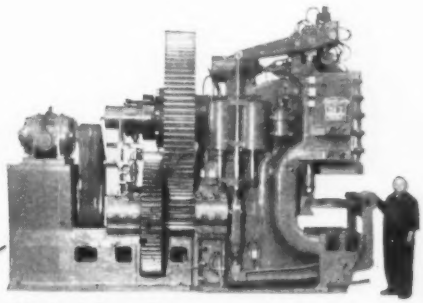
Brainard Steel Division, Sharon Steel Corporation
Griswold Street, Warren, Ohio

CLEVELAND
FABRICATING TOOLS

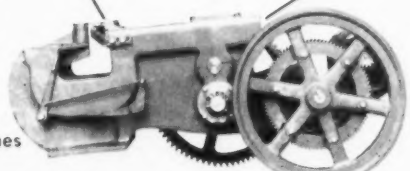
for Plate and Structural Steel



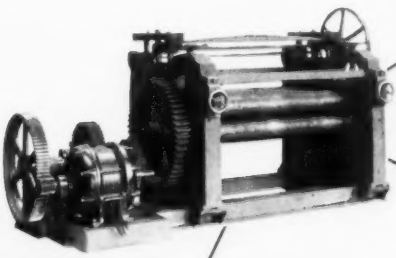
Bar Shears



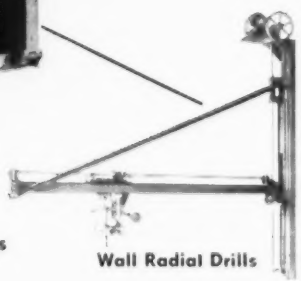
Vertical Open Gap Punching Machines



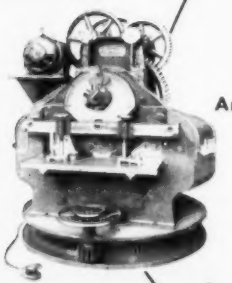
Horizontal Punches



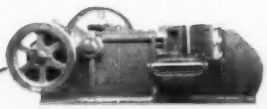
Straightening Rolls



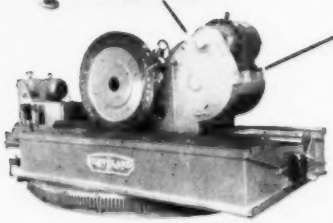
Wall Radial Drills



Angle Shears



Bending and Straightening Machines



Rotary Planers

Bending Rolls

Ruggedly built for profitable production and simplicity of operation, Cleveland Fabricating Tools are designed for trouble-free operation and years of service.

This dependable, economical performance of Cleveland Fabricating Tools is a proven fact with leading shipyards, bridge builders, railroads, structural steel shops and boiler makers.

Since 1880, Cleveland has engineered its complete line of tools to be the finest, most efficient for punching, shearing, bending, coping and notching bars, angles, plates, I-beams and other structural shapes. Write for Folder FT48 to help you determine the correct fabricating tool for your needs.

AA-6114

THE CLEVELAND PUNCH & SHEAR WORKS CO.
Established 1880

Power Presses
Fabricating Tools
Punching Tools & Dies

E. 40th and St. Clair Avenue, Cleveland 14, Ohio

Offices
NEW YORK
DETROIT
CHICAGO
PHILADELPHIA
EAST LANSING
CINCINNATI

Which metal do you want to strip?

There's an Enthone metal stripper for most applications:

☐ ENSTRIP "S" — an additive for sodium cyanide solutions used to dissolve nickel, copper, gold, silver, zinc, cadmium and alloys of these metals from steel without attacking the base metal in any way.

☐ ENSTRIP "A" — a fully-prepared alkaline mixture already containing sodium cyanide, used for the same purpose as Enstrip "S".

☐ ENSTRIP "Z" — an alkaline stripper that rapidly strips zinc from steel.

☐ ENSTRIP 103 — an economical, alkaline electrolytic stripper for removing nickel, copper, brass, zinc, silver, gold, cadmium, tin and lead from steel.

☐ ENSTRIP CR-5 — a rapid, acid-type dry salt stripper that dissolves heavy deposits of chromium from steel, nickel, copper base alloys, stainless steel and aluminum.

☐ ENSTRIP "T-L" — a fast-acting, dry alkaline stripper for dissolving tin, lead, solder alloys, tin-zinc alloys and zinc from steel base metals.

☐ ENSTRIP 165S — a neutral dry-additive for acid solutions for quick removal of nickel, tin, lead, zinc, cadmium, iron and aluminum from copper and copper base alloys.

☐ ENSTRIP L-88 — a completely prepared acid electrolytic stripper for removing copper, nickel, chromium, brass, bronze, iron and white brass from zinc-base die castings.

These eight outstanding strippers are "stock" items in the Enthone line of chemicals for the metal finishing and electroplating industries. In most cases, one of the "Enstrips" will prove to be the answer to your problem. On the other hand, special developments are available from Enthone to meet requirements not covered by the Enstrips featured above. Write us, outlining your needs, and include a sample of your product, if possible. We'll be glad to recommend the best stripping method possible.

Write to Dept. IA-11

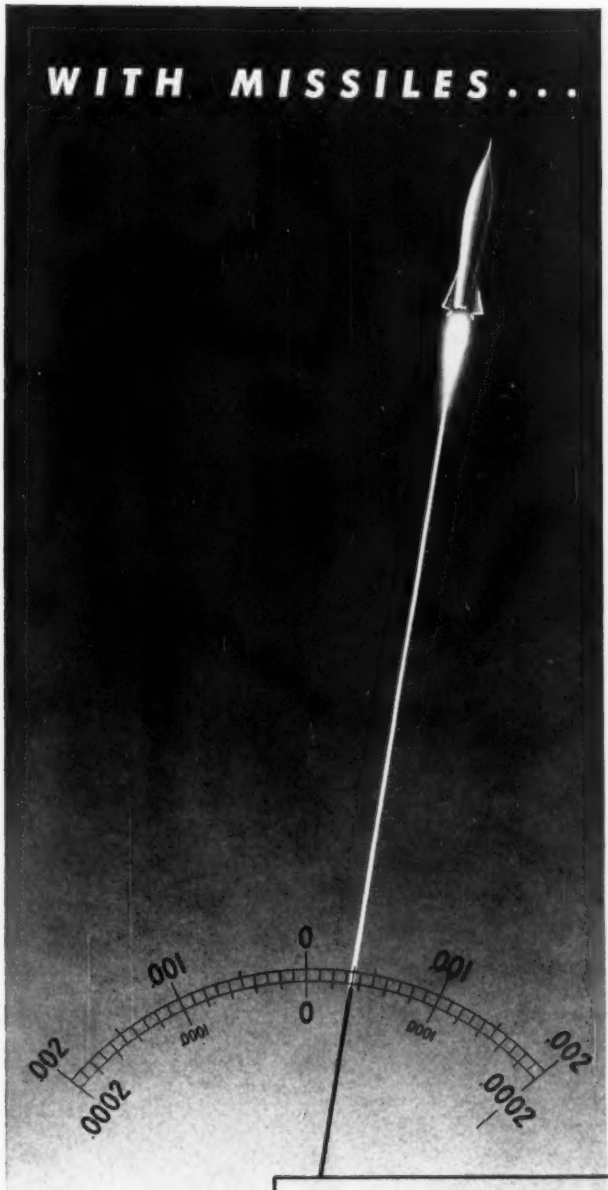
DISTRIBUTION AND SERVICE THROUGHOUT THE UNITED STATES, CANADA, MEXICO, BRAZIL AND EUROPE

PRODUCTS OF Enthone — THE SCIENTIFIC SOLUTION OF METAL FINISHING PROBLEMS

ENTHONE

ENTHONE
INCORPORATED
442 ELM STREET, NEW HAVEN 11, CONN.
Metal Finishing Processes • Electroplating Chemicals

SUBSIDIARY OF AMERICAN SMELTING AND REFINING COMPANY



SO MUCH DEPENDS ON PRECISION GAGING

it pays to rely on —

FEDERAL

Precise control over dimensional accuracy of missile parts and components is an acknowledged necessity. Whether the machined part must be accurate to .001" or .000010", its conformity to size must be known with unquestionable certainty.

Supplying gages that provide high-order precision and dependability calls for special engineering experience and skill, plus a full understanding of the unusual problems involved. Over thirty-five years' experience and 30,000 successful gage designs, many of them for missile contractors and sub-contractors, proves that Federal has these qualifications. Whether you need one gage or a whole gaging program, Federal's experience in gages and gaging programs for missiles can pay off in safeguarding your productive effectiveness.

Only Federal has four different systems of gaging from which to impartially select the one best suited to your needs — another reason why Federal has more to offer in precision measurement.

We're ready to offer you precision gaging ideas which have been so successful for other producers of missile parts and components.

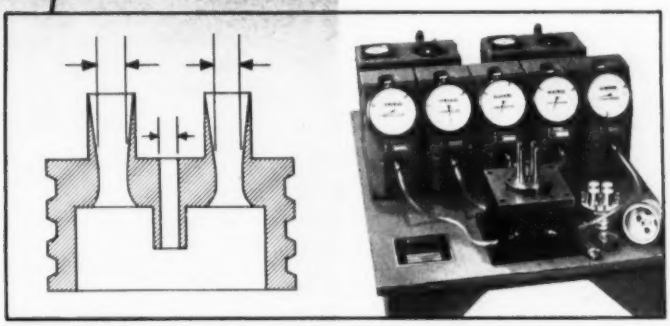
Write us concerning your needs.

FEDERAL PRODUCTS CORPORATION

71311 Eddy Street **Providence 1, R. I.**

FEDERAL has supplied precision gaging for: —

- **NIKE**
- **CORPORAL**
- **ATLAS**
- **DART**
- **SPARROW**
- **MATADOR**
- **FALCON**
- **FIREBEE**
- **NAVAHO**



FOUR NOZZLE DIAMETERS CHECKED SIMULTANEOUSLY
Multi-unit air gage (Dimension-air) uses four contact-type air plugs to check diameter of land in nozzles (tolerance ±.0005"). Regular air plug checks centrally located bore (tolerance ±.0002"). Nozzle assemblies and masters shown on gage platform.
(Other missile gaging applications to .000010" accuracies.)

Ask **FEDERAL** *First*

FOR RECOMMENDATIONS IN MODERN GAGES . . .

Dial Indicating, Air, Electric, or Electronic — for Inspecting, Measuring, Sorting, or Automation Gaging

Ferro alloys, of course! And Vancoram ferro alloys are the finest you can use for stainless and heat-resisting steels and irons.

Regardless of your melt-shop requirements, there are Vancoram products that will meet them exactly. Look no further than the Vancoram line. It's complete – and it offers you unexcelled quality, backed by unexcelled service!

CHOOSE THE RIGHT ALLOYS FROM VCA'S COMPLETE LINE

EXLO® (max. .025% and max. .05% Carbon grades)
Standard High Carbon Ferrochromium
Ferrochromium "55"
Ferrochromium "63"
Low and Medium Carbon Ferrochrome—silicon alloys (4 grades)
Regular Low Carbon Ferrochromium (6 grades)
Low Carbon Ferrotitanium (5 grades)
Ferrocolumbium
Grainal Alloys
Silicon Alloys (all grades)

Write today for the Vancoram Products List which shows composition and applications of all Vancoram Products.

VANCORAM

VANADIUM CORPORATION OF AMERICA

420 Lexington Avenue, New York 17, N. Y.
Chicago • Cleveland • Detroit • Pittsburgh

Producers of alloys, metals and chemicals

Exclusive with the Heroult:

Operating Mechanism Independently Supported

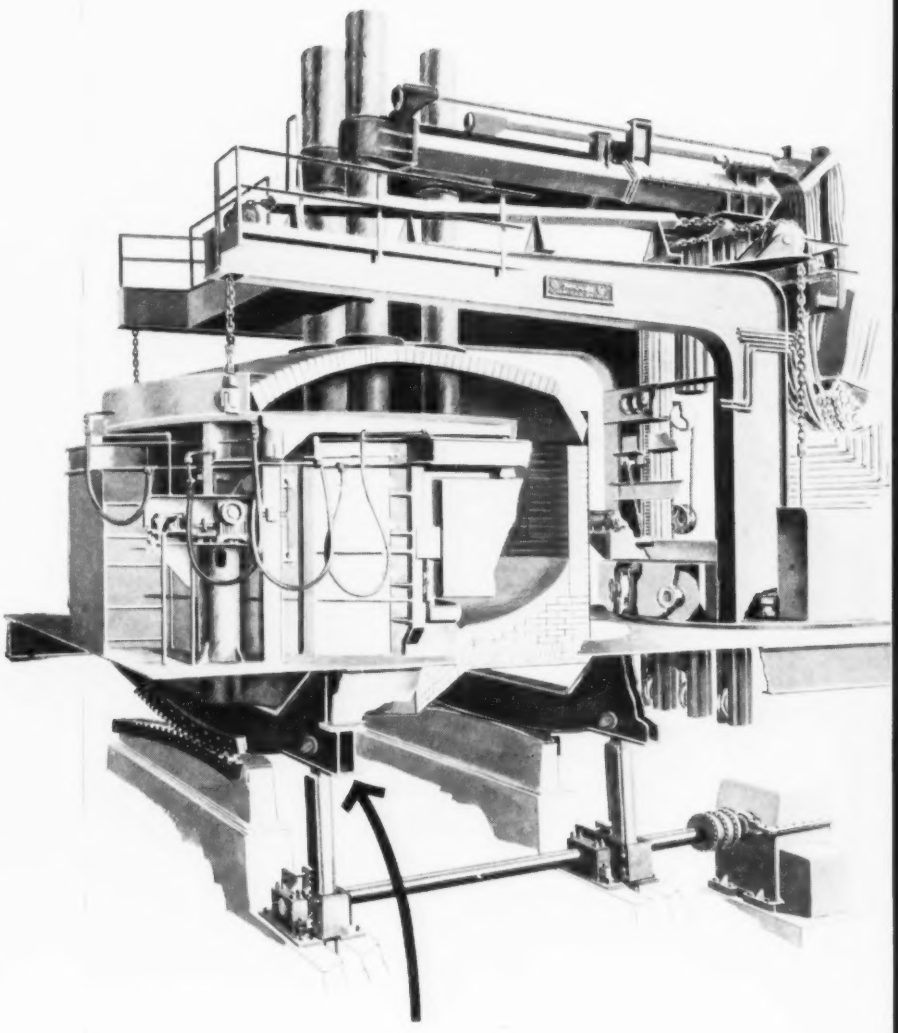
In Heroult's specially designed **new** furnaces the operating mechanism is located on the tilting platform, supported on rockers completely separate from the cage shell. In the event of shell warpage due to overheating, the mechanism remains unaffected and efficient production continues free from maintenance delays.

The independently supported operating mechanism which contributes to lower operating costs, and helps cut maintenance outlays to a fraction of former rates, is only one of the advanced design exclusives offered by the **new** Heroult for increased production efficiency. There are four others ready to operate on your behalf:

1. **Flat-bottom shells, for simplified relining jobs and good bath temperature distribution.**
2. **Water-cooled skew back roof ring, eliminates need for special roof refractories.**
3. **Cage-type shell construction, minimizes shell distortion and facilitates replacement of damaged shell plates.**
4. **100% mechanical operation, for reliability and ease of maintenance.**

There is a wide range of **new** Heroult Furnaces with shell sizes from 70" up, and with capacities from 6000 to 400,000 pounds. You can obtain them with non-magnetic induction stirring equipment, top charge, door charge, and special duplexing. Non-ferrous furnaces are also available.

The pioneers and leaders in this field for 51 years, Heroult specialists in electric furnaces can help you select and install the equipment best suited to your current and future needs. Get in touch with our nearest contracting office—today—for complete information.



USS TRADE MARK

AMERICAN BRIDGE DIVISION
UNITED STATES STEEL CORPORATION, GENERAL OFFICES:
525 WILLIAM PENN PLACE, PITTSBURGH, PA.
Contracting Offices in New York, Philadelphia, Chicago, San Francisco, and other principal cities.
United States Steel Export Company, New York

SEE THE UNITED STATES STEEL HOUR. It's a full hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

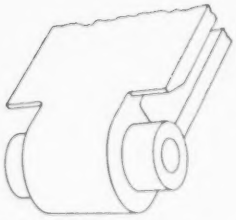
Heroult
ELECTRIC
MELTING FURNACES

UNITED STATES STEEL

TIGHTEN YOUR BELT ON COSTS!

SPECIFY HEAVY-DUTY THERMALLOY* CONVEYOR BELT

Designed by Electro-Alloys to eliminate the "crank-shafting" caused by extreme temperatures and heavy loading conditions. Short integral cast pin allows the link to adjust itself and transfer the load of the belt evenly to the rest of the links. Cast pin is approximately twice as strong in shear as the ordinary wrought alloy bar—and so designed that the bending stress is definitely lower than can be expected from the cast link of a conventional belt.

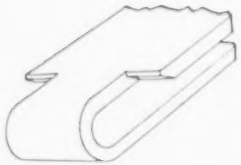


Typical heavy-duty link with cast pin.

FOR LIGHTER PARTS, SPECIFY THERMALLOY GENERAL PURPOSE

A loop-type casting design, suitable for general heat-treat applications in industry. Available in either 3" or 4" pitch. The 3" pitch is a light-duty general-purpose belt, weighing 17 lbs. per sq. ft. The 4" pitch is primarily designed for intermediate loads of somewhat larger parts, and weighs 21 lbs. per sq. ft.

*Reg. U. S. Pat. Off.



Typical 3" or 4" pitch center link of loop-type casting design.

WRITE FOR BULLETIN T-241

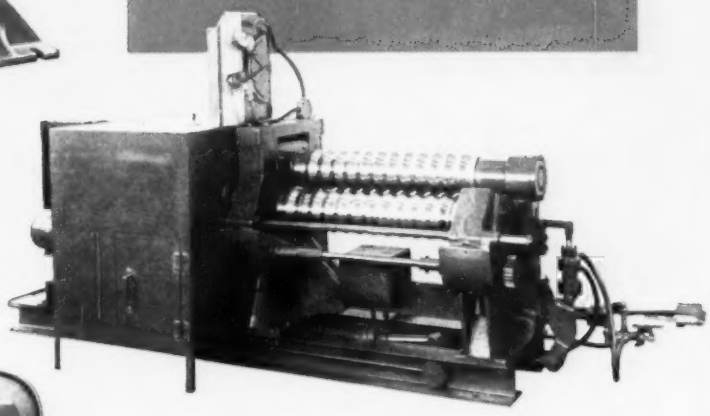
. . . giving additional design and application information on both Heavy-Duty and General-Purpose Thermalloy Conveyor Belts. Address: Electro-Alloys Division, 80111 A Taylor St., Elyria, Ohio.

AMERICAN Brake Shoe COMPANY

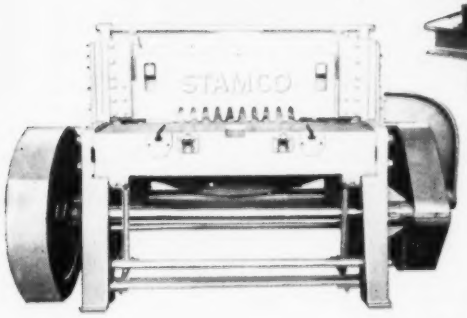
ELECTRO-ALLOYS DIVISION ELYRIA, OHIO

for roll corrugating and culvert forming, see Stamco

Stamco high duty culvert punch and riveter equipped with air operated friction clutch brake and cam stripper.



Stamco 8 ga. culvert curving roll with air operated endgate and motorized roll adjustment.



Stamco 8 ga. x 36" corrugated shear.

Stamco #6A high speed corrugator.

LAY YOUR CORRUGATING PROBLEMS AT STAMCO'S DOOR

Stamco, Inc., New Bremen, Ohio.

ROTOR SHAFT STEEL

For the Unseen Heart of a High Speed Turbine

In the heart of a turbine is a huge, single piece, forged rotor shaft.

It takes a combination of skillful, reliable men, and the finest equipment to produce the superior quality, strength and soundness required by these large, fast-rotating forgings. The Erie Forge & Steel Corporation's Research and Development program has the responsibility from selection of raw materials, through melting, forging, heat treating, machining and testing to make quality ingots and forgings that easily meet the greater technical perfection imposed by the Electrical Industry.

This 90" diameter ingot, of high alloy steel, weighs approximately 230,000 pounds. It will be forged on this giant forging press to produce a finished machined turbine rotor shaft, weighing approximately 70,000 pounds.

Here is evidence of the capabilities offered you at Erie Forge & Steel Corporation.

Place your requirements with us, fully confident of the desired results.

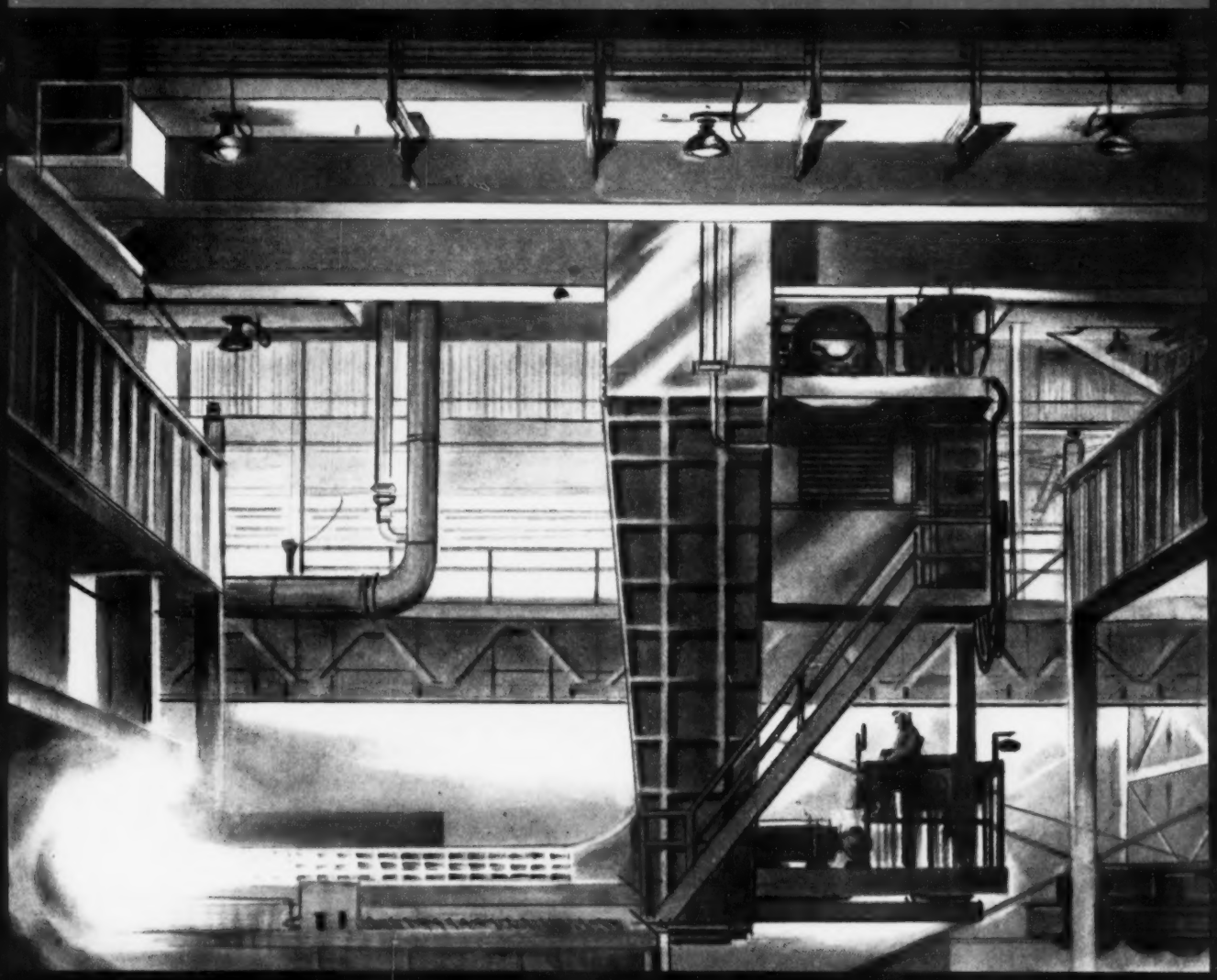
ERIE FORGE & STEEL CORPORATION

ERIE, PENNSYLVANIA

MEMBER AMERICAN IRON AND STEEL INSTITUTE

ERIE FORGE & STEEL CORPORATION

CRANE-TYPE SLAB CHARGING MACHINE



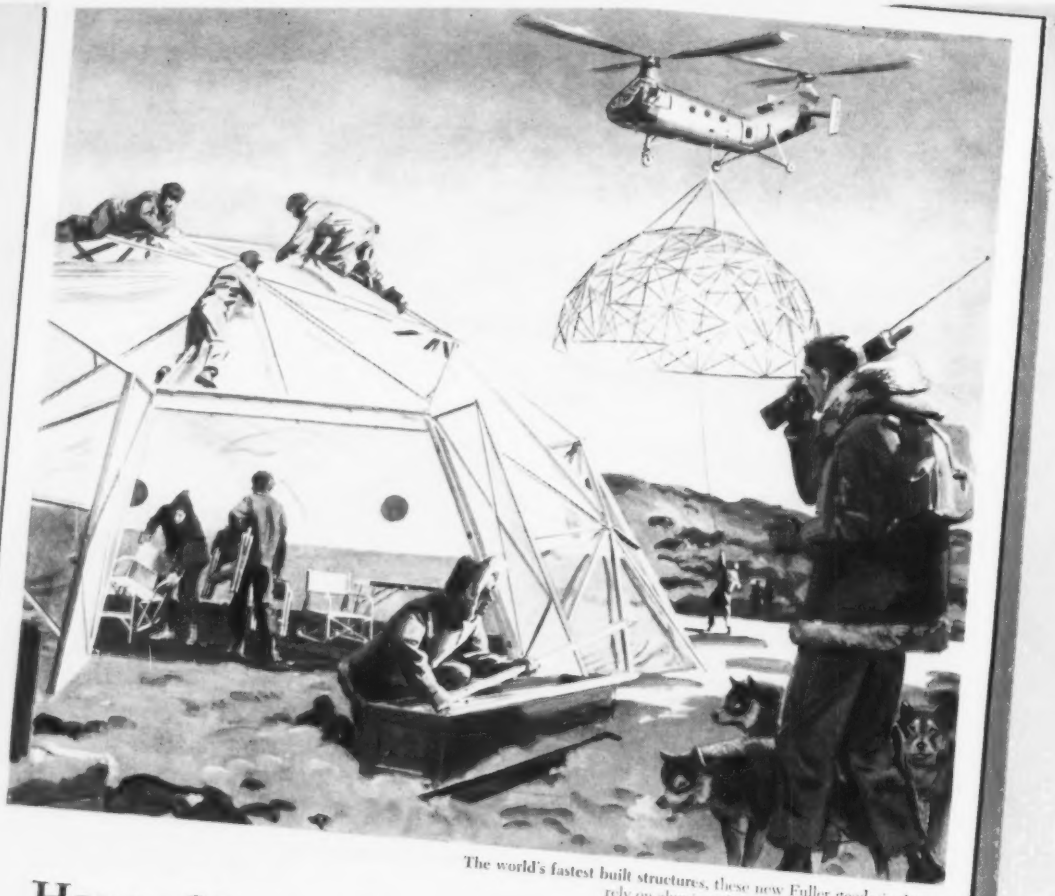
This 20-ton crane-type slab charging machine is equipped with end grip tongs. There are no tracks on the floor to hinder movement of wheeled equipment. The peel and mast are arranged for 360° rotation. Peel raises and lowers in horizontal position at all times. The operator's position, with reference to the peel and slabs he is handling, is fixed. His vision is unobstructed. This is one of many safety-engineered Alliance heavy-duty handling devices. For practical, economical solutions to your materials handling problems consult the Alliance engineers. They'll work with you to create the one device that meets your needs best.

Alliance

"Give us the Runway and we'll lift the World"

THE ALLIANCE MACHINE COMPANY • MAIN OFFICE • ALLIANCE, OHIO

LADLE CRANES · GANTRY CRANES · FORGING MANIPULATORS · SOAKING PIT CRANES · STRIPPER CRANES · SLAB AND BILLET CHARGING MACHINES · OPEN HEARTH CHARGING MACHINES · SPECIAL MILL MACHINERY · STRUCTURAL FABRICATION · COKE PUSHERS



The world's fastest built structures, these new Fuller geodesic domes rely on aluminum's unique lightness and strength

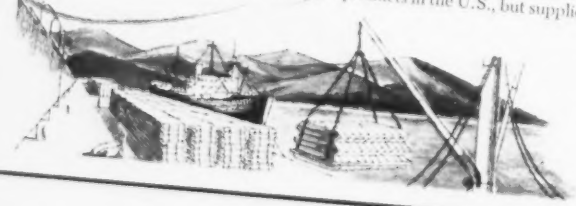
House 20 men in 20 minutes...anywhere!

Want to house a gang at summer camp? . . . put a whole garden in a greenhouse? . . . enclose a swimming pool? Try an inexpensive geodesic dome of translucent plastic and "care-free" aluminum. They're unbelievably strong, yet have no central supports.

Aluminum is ideal in so many roles that a steady flow of this metal is now essential to our economy. Fortunately, neighboring Canada is one of the world's most dependable sources of aluminum. Why? Because in Canada's river-rich northland over 1½ million kilowatts of hydroelectric power have been harnessed solely for aluminum smelting, *an electrolytic process consuming over 18,000 kw hours per ton.*

Aluminum Limited sells no consumer products in the U.S., but supplies essential raw material to independent metal fabricators. This year Aluminum Limited will ship 40% of its entire Canadian production to the United States, a major contribution to our consumer, industrial, and defense requirements.

Aluminium Limited, Montreal: *Canada's independent producer of aluminum ingot for U.S. industries.*



Aluminum from Canada

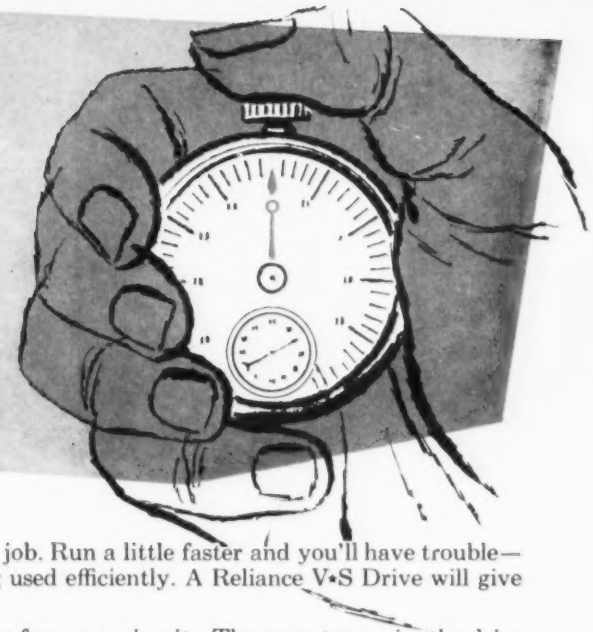
Aluminum plus imagination made this possible!

This portable shelter contains two essential ingredients: aluminum's lightweight strength . . . and skilled design engineering. Are you making the most of aluminum's unique properties in your manufacturing operations?

Aluminium Limited *Sales, Inc.*

630 Fifth Avenue, New York 20, N.Y. Cleveland, Chicago, Los Angeles, Detroit, Atlanta, Buenos Aires, São Paulo

how do you measure your production?



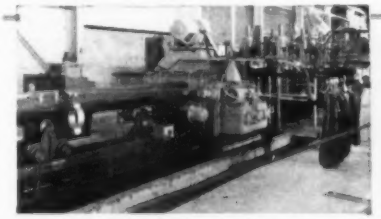
There is a *just-right* production speed for every job. Run a little faster and you'll have trouble—a little slower and your equipment is not being used efficiently. A Reliance V•S Drive will give you the *just-right* speed for each job.

Reliance V•S is an all-electric drive that operates from a-c. circuits. The operator varies the drive motor rpm. to set up the ideal speed for every job. With no rigid set of gear ratios with a limiting number of speeds, he has an infinite selection of rpm.'s from a wide flexible band of operating speeds.

There is a V•S Drive designed for your equipment. Write for Bulletin D-2311.

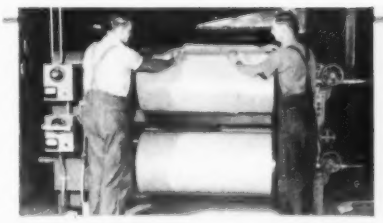
• TONS PER HOUR

In order to maintain a uniform production rate of 80 tons per hour with varying sizes of pipe, this pipe mill must change its line speed from 30 ft. per minute to 80 ft. per minute to compensate for differing gauges of steel. A 500 hp. multi-motor V•S Drive does the job.



• YARDS PER MINUTE

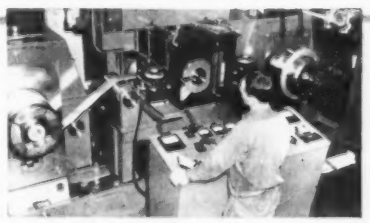
In order to properly size differing types of cotton cloth, the textile slasher must operate at line speeds varying from 28 yds. per minute to 225 yds. per minute. A 25 hp. V•S Drive does the job.



• REVOLUTIONS PER MINUTE

In order to maintain the correct tension on the metal on this highly accurate rolling mill, the speed of the coil winder must decrease from 900 rpm. to 450 rpm. as the diameter of the roll builds up. A 20 hp. V•S Drive does the job, automatically.

D-1563



RELIANCE ELECTRIC AND ENGINEERING CO.

DEPT. 211A, CLEVELAND 17, OHIO • CANADIAN DIVISION: WELLAND, ONTARIO

Sales Offices and Distributors in Principal Cities

AMERICAN ORIGINALS IN IRON AND STEEL

The treasure and the fallen tree

Only after great perseverance and hardship were the tremendous iron ore reserves of this country's Lake Superior region pinpointed. Men struggled hard and long through the tangled brush, the bogs and rocks of the rough country with inaccurate maps and, often, only scraps of information.

One day in the year 1845, P. M. Everett and a Chippewa Indian chief, Marji Gesick, were investigating earlier reports concerning large iron deposits near Negaunee, Michigan.

As Everett gazed about the wild and rugged country, his attention was attracted by a nearby fallen tree, the roots of which had torn a deep bowl-shaped depression in the forest floor. Scrambling to the spot, the white man and the Indian made an important discovery.

In the rain-washed crater they saw the tell-tale red-orange markings of iron ore. Further examination proved that here, in abundance, was ore of a truly remarkable richness. *And thus was first revealed the treasure of the, now famous, Marquette Range.*

Later as the Marquette, Menominee and other ranges were developed, new methods and materials were required to make the best possible use of these new-found resources.

Important among these materials, then as now, were Baker's Magdolite and Jebcolite . . . developed to produce more uniform ingots at lower refractory costs. Today Baker's Magdolite and Jebcolite are better in 5 ways: in composition, preparation, economy, quality and strength. Make sure you are using them!

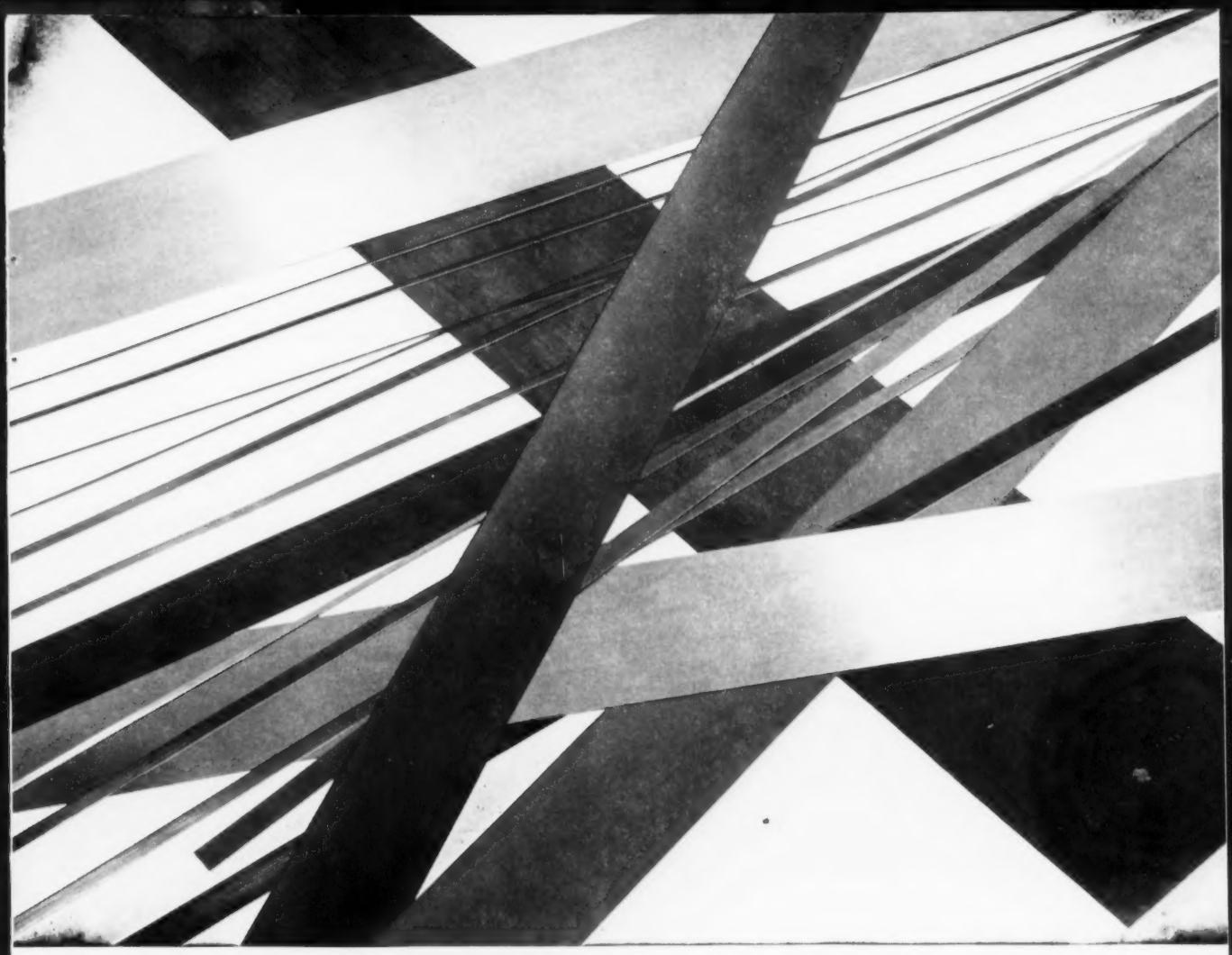
ANOTHER AMERICAN ORIGINAL

JEBCO
PRODUCTS
SINCE 1889

BAKER'S MAGDOLITE
The original dead-burned dolomite

THE J. E. BAKER COMPANY

YORK, PENNSYLVANIA • PLANTS: BILLMEYER, YORK, PENNSYLVANIA • MILLERSVILLE, OHIO



How these "educated" steels make products behave better

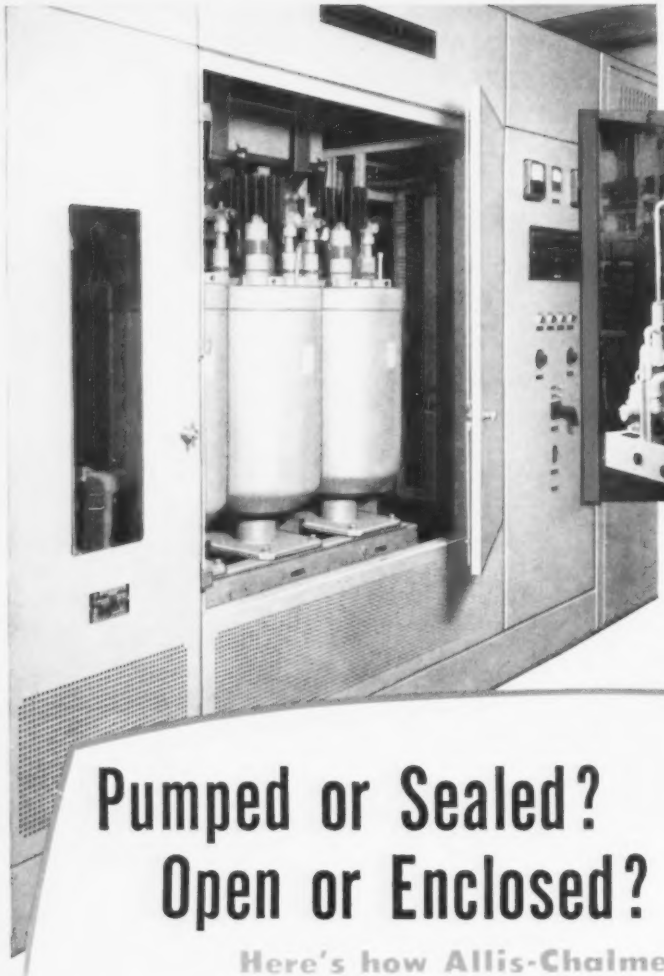
● Nobody will deny that there can be a vast difference between steels that are supposedly alike. The difference lies in "tremendous trifles" that often make all the difference between smooth and erratic fabrication or between satisfactory and faulty product behavior.

That's why the steels shown above are "educated", you might say—educated for special use. Because here at the *Athenia Steel Division* of National-Standard we've concentrated for years on learning about and *controlling* those tremendous trifles! In turn, this learning and experience is put right into the Athenia steels that successfully meet many of the toughest assignments known today.

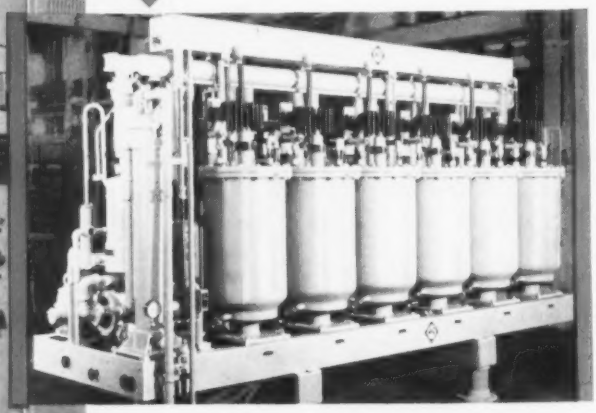
If your production calls for cold rolled flat steels of .45 carbon or higher, from .015" to 16" wide and from .001" to .065" thick, it would be a good idea to explore Athenia quality, performance and service.

NATIONAL NS NATIONAL-STANDARD Company **STANDARD**

DIVISIONS: NATIONAL-STANDARD, Niles, Mich.; *fine wire, stainless, music spring and plated wires* • WORCESTER WIRE WORKS, Worcester, Mass.; *high and low carbon specialty wires*
WAGNER LITHO MACHINERY, Secaucus, N. J.; *metal decorating equipment* • ATHENIA STEEL, Clifton, N. J.; *flat, high carbon spring steels* • REYNOLDS WIRE, Dixon, Ill.; *industrial wire cloth*



Open pumped tube unit permits easy access for inspection. Easy to recondition in field.



Enclosed sealed tube unit conserves space, cuts installation costs, eliminates need for vacuum pumping system.

ALLIS-CHALMERS

Mercury Arc Rectifiers

Pumped or Sealed? Open or Enclosed?

Here's how Allis-Chalmers can help you choose a rectifier for your job—

BOTH sealed and pump-evacuated tube rectifiers offer distinct advantages, depending upon the application. Whether your rectifier should be open or enclosed construction also depends on the application. Since Allis-Chalmers offers you a choice of sealed or pumped tubes in either open or enclosed construction, you get an unbiased recommendation, based on a study of your needs, and not on commercial expediency. And you can be sure of unsurpassed reliability and ease of operation, as proved in hundreds of Allis-Chalmers installations.

Only Allis-Chalmers Excitron Rectifiers give you all these important advantages—

- Fixed excitation anode does not contact mercury — is independent of level, turbulence or impurities.
- Continuous excitation eliminates need for reignition — pilot arc always present.
- Grid phase control located in clean region near anode where ion density is lowest.
- Internal cooling system provides high heat transfer with seamless tube coil.
- Arc-over-free tube eliminates arc-over danger by insulating entire arc path.
- Enameled anode seals provide high strength, trouble-free seal.

For detailed information on mercury arc rectifiers contact your nearest A-C office, or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin, for bulletin 12B8494.

ALLIS-CHALMERS

A-5560

High Temperature Powder

Aluminum powder-metallurgy products for use at temperatures up to 900°F are now being made. This is 300 to 400° higher than present temperatures at which conventionally produced aluminum alloys can function efficiently.

New Missile Projects Daily

Strong planning for missiles, rockets, and space travel is finally shaping in Washington. Not only are old cutbacks being wiped out, but new projects are being authorized daily. Hiring is on the rise. It all adds up to a jump in military spending to around $40 billion, compared to this year's $38 billion.

Coat Graphite With Carbide

Apply a carbide coating on graphite parts, and not only does performance improve, but new applications are uncovered. Possibilities extend from nuclear reactors to die casting machine inserts. Melting point of the coating is 2000°C (3632°F) or higher, with a hardness of 2000 Vhn.

Aluminum Curtain Walls

Enameled aluminum sheets which are formed after painting are being used for the first time in curtain wall construction for a new office building. The sandwich of inside and outside colored sheets is fastened to beams with welded studs. Installed cost is about $1.35 per sq ft.

Spot Weld Through Plastic

A new millisecond spot-welding process welds plastic coated steel without disturbing or damaging the plastic. It overcomes a major handicap in using plastic coatings on metals.

Imports Hurt South

Southern producers of reinforcing bars are finding the going rough for two reasons: There's more active competition from Northern mills. And they have to bear the brunt of rising imports. The tonnage jumped from 98,000 tons in the first seven months of 1956 to 114,000 tons in the same 1957 period. Florida and other Southern coastal areas are big import targets. U. S. Commerce Secretary Weeks indicates there will be no government step to slow imports at this time.

Valve Seats on Teflon

A new valve-seating arrangement handles petroleum products from heaviest viscous fluids to lightest gases at pressures up to 5000 psi. Sealing efficiency comes from a Teflon seat insert. The insert will not flow; is immune to acids and alkalis; will not vulcanize and never needs lubrication.

Vacuum Casting Advances

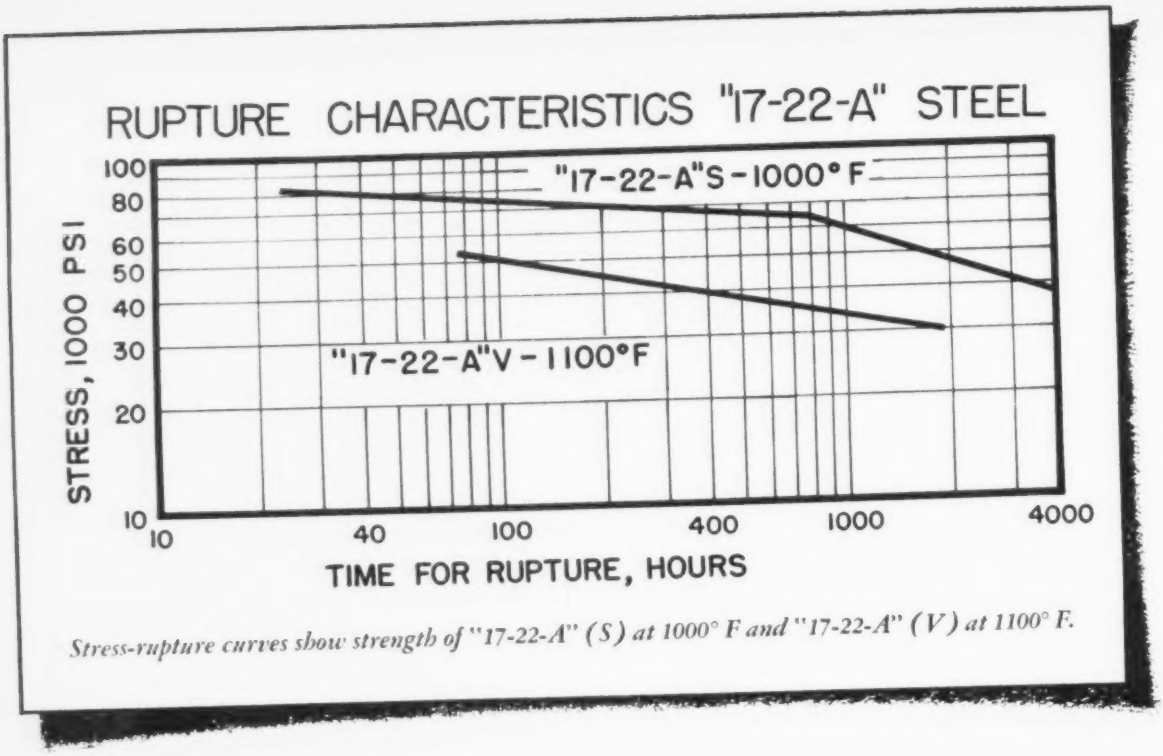
Progress is being made in vacuum casting zinc parts. Successful production of appliance and automotive parts, some of which couldn't have been cast otherwise, dispells early disillusionment with the process. Look for the process to be extended to aluminum alloys. They're now being cast on experimental basis. Magnesium and brass are also a good bet for the future.

New Record?

Shipments of steel structurals and plates are about to set a new peacetime record. Nine-month shipments of almost 13 million tons come close to the full year total of 1956. They've surpassed the nine-month total for 1955 by 4 million tons.

Fear Executive Layoffs

Some machine tool builders, hard hit by the current slowdown, hope that business picks up before workers layoffs extend to the junior executive level. Firms have put considerable time and money into the training of these selected young men. Fear is that if they're forced to let them go, chances are they'd never get them back again.



Stress-rupture curves show strength of "17-22-A" (S) at 1000° F and "17-22-A" (V) at 1100° F.

HOW MUCH ALLOY DO YOU NEED

to make high temperature parts?

YOU don't have to use expensive high alloy steels to make airplane brakes, gas turbine or other parts that must operate at high temperatures. The Timken Company's "17-22-A"S steels, containing less than 3% alloy, give *high* alloy *performance* with maximum strength up to 1100° F. You cut costs, save strategic alloys.

What's more, "17-22-A" steels are highly resistant to heat checking and thermal cracking. They are readily workable up to 2300°F., easily machined and welded. And maximum high temperature properties can be developed by normalizing and tempering, minimizing the possibility of distortion and quench cracking.

Write for complete information on "17-22-A" (S) steel, and its companion analysis, "17-22-A" (V), recommended for temperatures up to 1100°F. Ask for Technical Bulletin 36B. And feel free to ask our technical staff for help on your high temperature steel problems. They've solved hundreds of them. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable: "TIMROSCO".

TIMKEN STEEL

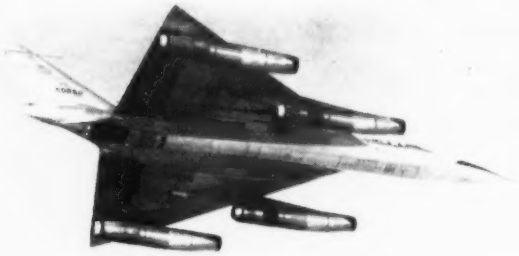
Fine Alloy

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS STEEL TUBING

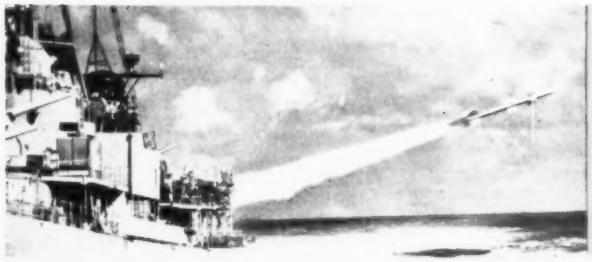
clear devastation would put a quick landing craft, and the familiar weap- Sputnik. Now a $1 billion budget

Procurement Changes With Defense Concept

Samples of Defense Spending (Obligational Authority in Millions of Dollars)



AIR FORCE	1956	1957	1958 Before Sputnik
Aircraft and Related	5,543.0	5,374.8	5,688.1
Guided Missiles	862.8	1,558.1	1,406.1



NAVY	1956	1957	1958 Before Sputnik
Aircraft and Related	2,013.1	1,611.4	1,656.8
Missiles, Drones, Etc.	118.2	233.9	236.8

ARMY	1956	1957	1958 Before Sputnik
Major Equipment	866.7	585.0	513.0
Ammunition and Missiles	901.1	931.0	781.0
Industrial Mobilization	125.6	139.0	100.0

Source: U. S. Budget

How Hard Will Missile Spending Hit Industry?

Some Programs Will Gain at the Expense of Others

A stepped-up missile program means a defense budget increase is certain.

But it also will bring further cutbacks in buying of conventional weapons.

Extent of these cutbacks poses a problem.—By R. O. Schulin.

▪ The big question in defense spending now is not just "How Much?", but "Where?"

Even before the launching of Sputniks I and II, the shift in defense spending was strongly away from conventional weapons. Now, the pressure for all-out emphasis on missiles is even stronger.

Forces in Being—Advocates of the "forces in being" concept of defense found their case strengthened by the Russian satellite launching, with the apparent proof of Red superiority in missile development.

In the "forces in being" concept of defense, it is assumed that nu-

General Motors Corp., which last

clear devastation would put a quick end to any war. Mobilization would be eliminated. Stockpiles and industrial potential would be useless. Outcome would depend on weapons on hand, possibly on those in a state of complete readiness.

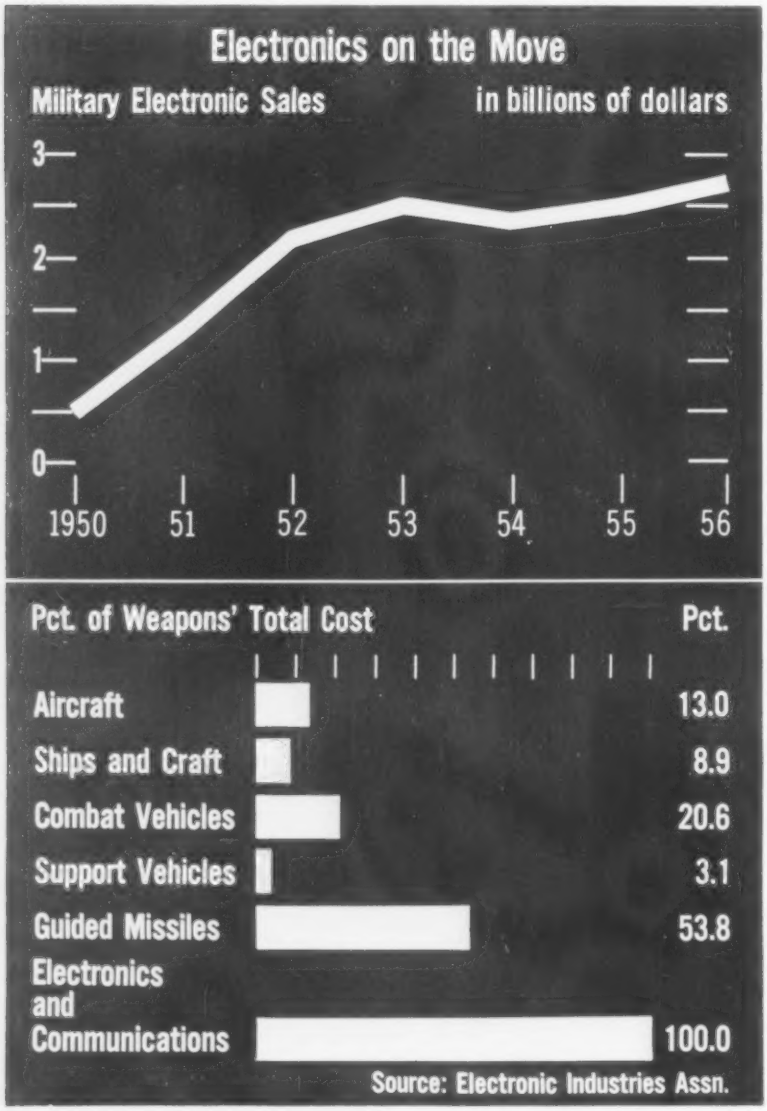
Against this concept are the advocates of more conventional preparedness. They believe the manned aircraft capable of delivering nuclear weapons anywhere in the world will be the backbone of defense for some time to come.

What About Brush Fires—Particular emphasis is placed on the necessity of dealing with "brush fire wars," which would require conventional infantry, artillery, landing craft, and the familiar weapons of war.

At stake in Pentagon planning are millions of dollars in contracts for machine tools, aircraft, ordnance, and automotive equipment. Shifts in defense planning have significant importance to these industries and their suppliers.

Stockpile Re - examined — Already, Mobilization Chief Gordon Gray has ordered a re-examination of the raw materials stockpiling program.

Dept. of Defense figures show that total missile procurement climbed steadily from $21 million in 1951 to an estimated $2.1 billion this year. And this was before Sputnik. Now a $1 billion budget increase seems certain. Some Senate leaders have hinted that a $2 billion increase in missile spending might be coming.



A Few Years, Maybe—Russia's lead in the missiles race doesn't mean the U. S. conventional weapons are not to be reckoned with. Said Orval R. Cook, retired Air Force general and president of the Aircraft Industries Assn.:

"Our capabilities of striking with nuclear force from our many advanced bases, from ships at sea, and from long-range aircraft . . . are even more important to us now than the prospect of ICBMs several years hence."

Here's the outlook for major areas of defense buying as it appears now:

Machine Tools:—Some cutbacks in tool buying can be expected. There will be a tightening in the management of the machine tool layaway program.

Asked if there were any chance that the $4½ billion in stored-up machines and equipment would be disposed of by the Army Ordnance Corps, Col. C. S. Casto, chief of the Industrial Preparedness Branch of the Army's Procurement Div. replied an emphatic "No!"

"There is no change in our mobilization base," he said. He pointed out that in fact there will be increased emphasis on the layaway program. "But you can look for more austerity," he said. When a weapon becomes obsolete, its production equipment will be used as replacements wherever possible.

As an example, the Army's 90 mm antiaircraft guns have been discontinued as a defensive weapon. In its place is the 90 mm Nike missile which is better able to cope with today's supersonic aircraft. Equipment held in layaway for 90 mm shell production now can be used for other purposes.

Automotive—The shift of big money contracts to missiles and electronics has cut deeply into automotive orders. Pointing this up is

General Motors Corp., which last year dropped from 2nd to 16th in a list of the 100 largest defense prime contractors.

An Army procurement study on the "abrupt shift from conventional armament to missiles from 1954 to 1956" shows the Army had 102 prime producers of conventional weapons under contract in 1954. By 1956, the number dropped to 42. Supplying vehicles to the Army in 1954 were nine combat and 12 non-combat producers. The number was cut to three combat and six non-combat vehicle producers in 1956. The Army spent $345 million for both types in 1957. It is not likely future buying will exceed this rate.

Armament — The three conventional armament classifications—155 mm, 105 mm, and 90 mm ammunition, have suffered severe cutbacks since 1954. Funds for these totaled $1.1 billion in that year, but dropped to $475 million in 1956. The figure for 1957 is estimated at $320 million. Contractors will be lucky if they can hold that level.

Aircraft—The Air Force, meanwhile, is buying fewer planes. In 1953, a peak year, it ordered 11,000 planes from industry. Last year, the total was 6800. The handwriting appeared on the wall in May when the Air Force made further cutbacks. And even more drastic changes are coming, the Air Force says.

The Air Force estimates that ultimately 90 pct of its air defense missions will be handled by missiles. Fifty pct of the Strategic Air Command and 30 pct of Tactical Air Command functions will go to missiles.

The Navy expects that within five years, 35 to 40 pct of its total spending for aeronautical products will be for missiles. The balance will be for aircraft. "All plans are geared basically to switch over to the missiles field," a Navy spokesman said.

General Cook adds that the great potency of nuclear weapons together with the high performance built into our aircraft and missile systems, has reduced the number needed.

The switch from aircraft to missile production will bring about some important changes in the aircraft companies, says Gen. Cook. During the next few years, the industry will be in a period of "compression." Only half the space now occupied by Air Force contractors will be needed for missile production. And there will be little in the way of subcontracting.

Electronics—Regardless of which road defense spending takes, one industry that should have smooth sailing is electronics. The cost of military electronics items in 1956 is estimated at $2.8 billion, or 10 pct of the cost of all weapons. And electronics account for 53 pct of missile costs.

Speed is a major problem not only in missiles and aircraft, but on the ground as well. The army points out that human reflexes work too slow to cope with modern requirements in target acquisition, battlefield surveillance, and logistics supply operations. The answer is in electronic equipment.

During World War II, a bomber equipped with data processing equipment was unheard of. Today it's a reality.

Shipbuilding—Missiles have given naval ship construction a shot in the arm—especially small and medium size vessels. Already 20 missile launching ships are in service, including cruisers, destroyers, frigates and submarines. And about 40 more are under construction or approved for construction or conversion. More approvals are coming. In the planning stage is a missile aircraft carrier.

Outmoded ships are being mothballed. Only this month the USS Wisconsin, last of the battlewagons, was retired from active service. It marks the first time in 62 years the Navy has been without a battleship in the active fleet.

The success of the nuclear-powered Nautilus has placed more emphasis on atomic power. In addition to the Nautilus, four nuclear-powered submarines have been launched, ten more are under construction.

Debate Rages Over Defense Concept

"Guided missiles will not completely replace manned aircraft. . . . The ICBM is not the absolute or ultimate weapon."—Orval R. Cook, retired Air Force general, now president of Aircraft Industries Assn.

Amounts available for defense spending this year are "stepping stones . . . to very much larger appropriations." — J. Sinclair Armstrong, Asst. Secretary of the Navy.

"We can have an antimissile defense and indeed we must have one."—General Maxwell D. Taylor, Army Chief of Staff.

"Industrial potential, in case of all-out war, would be almost useless . . ."—Henry Kissinger, executive director, Harvard University's International Seminar.

". . . Changed military concepts . . . may mean parts of our stockpiling programs need a different orientation." Gordon Gray, defense mobilizer.

"Interceptor aircraft are obsolescent." Lt. Gen. Stanley R. Mickelson.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Educators React to Ike's Appeal

Stress Need for Early Technical Training

Educators agree scientific interest must be stimulated. Compulsory courses urged.

Increased funds for much-needed basic research are necessary for U. S. to regain or hold technical leadership.

▪ The message of technical educators is finally getting through.

It took the shock of loss of leadership in some technical fields, brought out dramatically by the Russian satellites. It was aided by President Eisenhower's urgent plea for more and improved technical education, more funds for basic research.

Cheers for the President—The technical educator today, from the high school science teacher to the heads of famous technical institutes, is applauding the new urgency for better technical education. They hope the public won't be lulled into complacency before something concrete is done.

Following the President's address last week, The IRON AGE contacted leading figures in technical education. They were asked their reaction to the President's speech, and what steps they believe should be taken to achieve the goals.

Educators Recommend — The educators are near-unanimous in their recommendations. With little dissent they called for:

1. New emphasis and a stimulation of interest in science.

2. Stepped-up aid for basic research. We have "used up" what we have learned.

3. More and better mathematics and science in secondary schools, with emphasis on compulsory courses.

4. Better pay for science educators and scientists.

There were qualifications to these conclusions. For example, some educators hesitate to urge Federal aid. But they realize most of it will inevitably come from that source. In general, their reactions followed a similar route.

Quantity and Quality—Dr. Jefferson Davis, president of Stevens Institute of Technology, applauds the President's indicated aims of intensifying scientific education and stepping up basic research. He believes increased emphasis, both quantitative and qualitative, on science in elementary and high schools is essential to both aims.

He believes that scientific interest is largely a matter of "as the twig is bent," that more and better science teaching will interest more students in science as a career.

More Researchers Needed — Basic research is a more involved problem, Dr. Davis believes. He is in favor of Federal support of basic research and believes that college campuses are the most fruitful area. But he points out that many corporations are doing good work in basic research, and Federal aid should be available to them.

Dr. Davis dismisses statements implying we should double current spending on basic research, "because we don't have that many qualified men to do it."

Compulsory Courses — Dr. John C. Warner, president of Carnegie Institute of Technology, contends study of science and mathematics should be required in all secondary

PROBLEMS: President Eisenhower and Defense Secretary McElroy confer on missile race. The President last week called for stepped-up technical education and more expenditures for research, particular basic research.

How You Can Build a Market In

schools and "it should be required of each student to the maximum proficiency of which he is capable."

He notes that if universities received new students with training equal to the Russians, they could omit beginning courses.

Still Need Liberal Education—"This new emphasis on technical training does not mean that a liberal education is no longer important," Dr. Warner says, "but that its meaning has been changed to coincide with recent events.

"College preparation is intended to adjust us to the world in which we live, and to understand today's environment we must understand a great deal about science. It must become a greater part of liberal education, reversing the recent trend . . ."

Dr. Warner expects the government to give colleges more money for research, but does not want government financing to be so great it would restrict freedom.

Program for Individuals — Dr. Lee A. Dubridge, president, California Institute of Technology, suggests this program.

1. Support public schools and encourage more science teaching and higher pay for teachers.

2. There should be more science TV programs especially aimed at youngsters 10 to 18 years old.

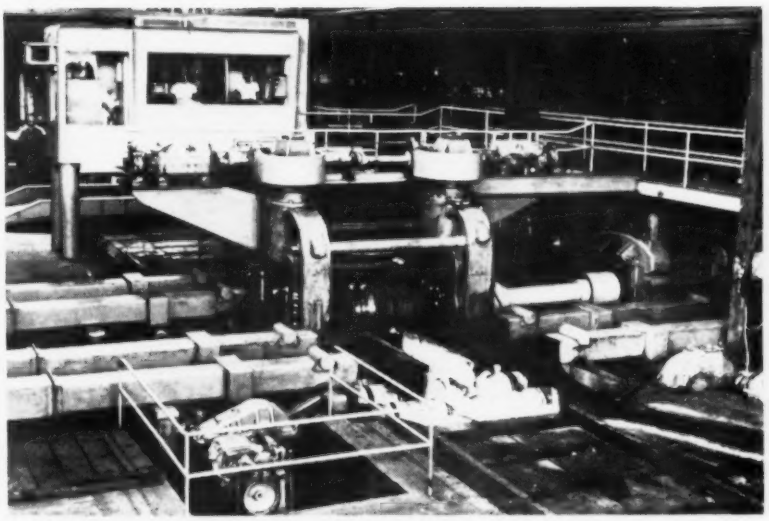
3. Establish prizes for best students in science and mathematics.

4. Establish scholarships for able and needy students.

Research Used Up — Dr. John T. Rettaliata, president of Illinois Institute of Technology, believes the government will have to set the pace to encourage basic research, probably through direct contracts from the armed forces.

Ideally, he would like to see unlimited basic research grants made by the Federal government, but doubts if this will happen.

He points out that we have just about used up all the information we have derived from basic research to date.



HANDLES TOUGHEST: New Latrobe Steel Co. mill rolls jet-age metals.

New Mill Will Roll Superalloys

▪ Highspeed steels and difficult-to-work superalloys are being rolled on a new mill developed by Latrobe Steel Co.

The 32-in. cogging mill is first to replace previous method of using large forges to hammer or press very hard steels.

These steels, explains S. G. Fletcher, the firm's vice president for metallurgy, "require unusual techniques in their rolling from the cast ingot. No 'common' blooming mill is capable of handling (them) without some damage — often serious — to their metallurgical structure." "By their very nature," he adds, "the alloys for which the mill was designed are among the hardest, toughest metals known to man."

Diamonds to Knead—The mill, with its furnaces and other allied equipment cost over $3 million. It includes a whole series of radical departures from traditional mill design.

It contains diamond - grooved rolls, rather than the usual box or flat blooming mill rolls. They give a rolling action which distributes hot deformation of the product more uniformly. This action produces the 'kneading' to compact and refine the internal cast structure of the ingot, Latrobe states.

The mill is equipped to handle all variations of rolling speed.

Eye on the Future—With the mill, ingots as large as 18 in. square and up to 4000 lb in weight can be processed. Billets as small as 3 in. sq. or slabs up to 12 in. wide can be turned out.

"We believe," says J. R. Larsen, Latrobe vice-president-operations, "that the time is coming when it will only be possible to produce the hardest tool steels and super alloys through rolling on a mill such as this."

"The mill," says J. E. Workman, executive vice president, "could lead to significant increases in the production of these vital steels . . . helping solve a crucial problem in the coming missile age."

Venezuela

How You Can Build a Market In

Here are some tips on how to do business in Venezuela and other Latin American countries.

The business is there if you take the time to understand the people you are dealing with.

You'll lose out if you take a brash, know-it-all attitude.—By Tom Campbell.

▪ Relationships—social and industrial — between Latin American countries and the U. S. have come a long way in the last 10 years. But there is considerable room for improvement on both sides.

Because the Republic of Venezuela has become leader of the South America economy, it is a practical and logical matter to see how one should do business there. The results will be applicable to other South American and Central American countries.

This from-the-source story by Editor-in-Chief Tom Campbell is based on interviews with Venezuelan businessmen, government officials, Americans in South America, construction bosses, oil officials, iron ore miners, new friends and old friends.

It was a return trip for him. In 1950 he visited and reported U. S. Steel's Cerro Bolivar iron ore project. Other Latin American trips to Brazil, Jamaica, Puerto Rico followed.

Be Sincere — No matter how much one cautions and advises North Americans there are many who claim they "have heard all this before." This may be true but this week in Caracas many North Americans will be doing things exactly as they should **not** do them. Others, older, wiser, and more sincere, will be having no trouble at all.

To get to the bottom of a good formula for doing business in Venezuela—or in other Latin American countries—it is necessary to eliminate the chip from the shoulder. Venezuelans with whom we do business are an advanced and courteous people. They have their own ideas of living and of industrial progress. They also have their ideas of how people should cooperate. Many of these ideas or customs may not be like ours—but this is no reason why Americans should not make an effort to understand, and act accordingly.

They Need Us—On the other side of the coin it can be said that Venezuelans and other Latin Americans could perhaps understand us better, why we do the things we do and why time seems to mean so much to us. Top level Venezuelans do know more about us than we suspect. They go out of their way to understand some of our peculiar actions.

Probably no other country in Latin America respects, needs, and welcomes American business people more than do the Venezuelans. Why then are there so many contracts "almost but not quite" closed between Venezuelans and people from the States?

Let's Be Blunt — Because this story is an objective and frank formula for doing business in South America, bluntness may be in order. If it seems that the Americans get the shorter end of the stick we can remember that the question is "How can **we** do business with Venezuela?" After all that country is the outstanding South American area with a firm currency, an energetic government, and a plan for progress that staggers the imagination.

Most people from the United States who have done little traveling —and many who have traveled— insist on believing that all South American countries are banana republics, with bandits, boa constrictors, yellow fever, and fantastically poor people. It simply isn't true, and the looks of amazement when Americans find it isn't true, are in fact an insult. This is true especially in Venezuela which is emerging as a country dedicated to railroad expansion, diversification of industry, expansion of oil production, extension of education, and dignification of the worker and the citizen.

Venezuelans Move Fast — The middle class in Venezuela is growing. Its sons are attending American universities. Some see a Doctor's Degree as a necessity. The worker class—or the blue shirts as they are called in U. S.—are emerging as a group whose wages are going up steadily and whose fringe benefits exceed those in America. Already the fringe in the oil industry of Venezuela equals the base rate of pay.

What has all this to do with how to do business there? Plenty! It is concrete proof that Venezuela is on her way! At times it seems she takes too long to get started; but once started she moves fast. If Americans want to be associated with the expansion of Venezuela then some must do their homework on how to get along with Latin Americans.

gets too far out of joint on this but it is a ghastly mistake that can result

the competitive price if business is to be done in Venezuela; but other

Mills Use

Venezuela

How Oil Firms Do It—Certainly the American oil companies have led the way over the years in close cooperation with Venezuelans. American oil firms have treated Venezuelans as equals—as partners—and have assumed they would be treated likewise. They have acted on the basis that the oil was Venezuela's; that negotiations could always be worked out for material benefits, and that the good of the country was a prime consideration in their business endeavor in Venezuela.

What has been the consequence of this? Today in Venezuela, American oil firms are friends of the country. Their officers are respected and trusted and their words are accepted as sincere, honest expressions without question. Any oil firm which acted otherwise would be ostracized by fellow Americans in Venezuela before the Venezuelans themselves showed their disapproval.

Old U. S. Custom—Practically, the oil firms have established the formula of 50/50—an old American custom. But this is by no means the whole story. Men sent to Venezuela to represent the American oil firms know the country, the people and the customs. They act as guests of the country but they lay their cards on the table.

Today more than 90 pct of the officials of Creole Oil Co. are Venezuelans. The same trend holds for other oil companies. It is a sense of pride to Venezuelans when their own people are accepted as top leaders in American-owned Venezuela firms.

No Room For Egotism — This brings home the negative side of some American actions—we often act superior whether we know it or not. That doesn't cause the Latin American too much pain—he often laughs about it. But it does make it easier for German, French, Italian, or Swiss industrialists to get the order. Only when a combination of blunders adds up to an impressive total do we wake up to the cost.

Probably the biggest barrier to better relations between new friends of Venezuelan industrial people is the language barrier. Little effort is made by most North Americans to learn even a smattering of Spanish. This is an important thing. Most Venezuelan businessmen, who head up big projects, speak good English. But it would be better if we adopted the ideas of Europeans toward knowing at least one other language—Spanish if we do business in South America.

Another drawback not mentioned in polite society in Venezuela is the practice of "sending the wrong man down."

Be Emotional — Nobody's nose

MODERN CARACAS: Venezuela is an up-and-coming South American nation. This modern skyline indicates the progress that has been made in Venezuela and other Latin American countries.

When in South America—

Please Do:

1. Use your best manners at all times.
2. Remember their country has its customs and proud moments.
3. Remember that Latin Americans are a great family people.
4. Take is easy; you will get farther.
5. Use moderation.
6. Use gentle humor.
7. Show confidence in your South American friends.
8. Obey the laws of the country.

Please Don't:

1. Brag about your country and yourself.
2. Say continually, "We had that long ago."
3. Rush into business before asking about families.
4. Drag out your watch as if you were catching a train.
5. Guzzle your drinks.
6. Be a wiseacre.
7. Act with suspicion showing on your face.
8. Act like a privileged character.

More Hot Metal In Steelmaking

gets too far out of joint on this but it is a ghastly mistake that can result in no contract. The man who comes from the States must be courteous, slightly emotional, observant, patient, friendly and a respecter of other people's ideas, customs, and beliefs. A big order? Yes! But necessary.

So, before you embark on South American business pick the right man from the States. Obtain the assistance of a Latin American who knows his people and your problems. Generally, American vice presidents—or presidents—are not equipped to do business in Venezuela or other Latin American countries unless they have spent considerable time there. In lieu of this, a man with authority, experience and knowledge of the country should always represent American companies. An office boy should never be sent to negotiate with a government minister or with a man of authority in Venezuelan industry.

Take Your Time—Quite a few Americans "pass through Venezuela" on their way to other countries. Moral: Never "pass through," come for at least 72 hours if you are to make important decisions or establish valuable contacts. If you fail in this rule you have only yourself to blame. Companies like General Motors are well aware of this simple rule.

On public relations and advertising Venezuelans can do you the most good in their own country—or those who know and understand the Venezuelans are a minimum necessity. U. S. Steel has as its public relations representative Walter Donnelly, who has done wonders for that company. The Venezuelans accept Mr. Donnelly—and then U. S. Steel. Last week General Motors appointed a Venezuelan to vice president in charge of sales promotion and advertising. John H. Gluski is a Venezuelan citizen with years of experience in advertising, editing, and public relations.

Quit Pushing — Obviously one must have the technical background, the authority to make contracts and the competitive price if business is to be done in Venezuela; but other matters are important, too. Using a social party as a business sounding board is not good. Pounding away at your "proposition" is usually a waste of time and in contrast with a leisurely covering of the points. Trying to close a deal on Thursday so you can get back to a New York golf game on Friday is bad taste and will in all probability lose you the contract—or make it difficult to get it.

The Venezuelans want American experience, knowledge, and technical help on those things we know best. It takes time and patience to get a contract ready. German, Italians, or French send authoritative persons who will take weeks (or months if necessary) to wind up an acceptable contract. Americans have lost out by showing lack of confidence and a failure to realize that relatively minor points can be negotiated later and also by taking a lofty attitude of "we must take it up with the home office."

A cabinet minister is hardly interested in spending his time with a representative who can't take action of any kind.

Don't "Promote"—Promoters are a pain in the neck to Venezuelans —especially when they say they "know" or are "good friends" of this or that "influential" Venezuelan—when they really don't. Never use the "promotional" approach in Venezuela and don't get fouled up with questionable people who claim to be close friends of this or that minister —but aren't. Check with reliable Venezuelan business people or government people; ask your own Consul; or check around yourself. Venezuelans have been burned by some American promoters and anything that sounds like them is suspect.

In dealing with Latin Americans you just have to be sincere. If you are not, you lose—some way or another. If you act like you think you are going to be taken for a ride, it will show in your demeanor and will operate against you. You have every reason to believe your trust and confidence will be returned.

Mills Use

High blast furnace operating rate points up the trend to more hot metal, less scrap.

J&L president Adams says his company is using 78 pct hot metal.—By G. J. McManus.

▪ Speaking in New York recently, J & L President Avery Adams publicly spelled out what a number of steel companies have been saying privately:

More hot metal and less purchased scrap will be used by the mills for some time to come. Mr. Adams said J & L is now using 78 pct hot metal in its steel furnaces, that the company's reliance on outside scrap would be reduced on a long-term basis.

Behind The Trend — Statistics show these statements apply generally to the steel industry as a whole. In the current market situation, the mills are using more hot metal and less scrap in their steelmaking charge. In the next year and a half, they will increase blast furnace capacity more rapidly than steelmaking capacity.

The immediate picture is fairly clearcut. Scrap consumption dropped by 200,000 tons in June and by more than 500,000 tons in July. In line with this slide, the price of scrap has been dropping steadily since spring.

Scrap Price Slump—With major mills out of the market during summer and early fall months, prices of the best openhearth grades have tumbled more than $20 a ton. At least one mill besides J & L will not be buying dealer scrap for the rest of the year.

For the most part, reduced demand for dealer scrap stems from declining mill operations. The steel operating rate dropped from near-capacity in the winter to around 80

Imports Hit Oil Country Market

More Hot Metal In Steelmaking

pct in July. It has hovered about the lower figure since then.

Mills Quit Buying—In this market slide as in any other, the mills made their first materials cut on purchased scrap. They normally use about half scrap and half hot metal for peak operations. Of the scrap portion, less than half is purchased; the rest is generated by the mills themselves.

In other words less than 25 pct of the total metallic charge for peak operations is purchased scrap. If operations dip 20 pct while the hot metal and home scrap supplies remain constant, purchased scrap consumption must drop to less than 5 pct of total metallic use.

Iron Output Up — That's just about what has happened. There has been little reduction in the flow of hot metal since last winter. In January blast furnaces worked at 98.8 pct of capacity; in September they ran at 92.9 pct. In a period when blast furnace operations dropped less than 6 pct, steelmaking operations fell more than 15 pct.

Net result has been more hot metal per ton of steel. Part of the excess has gone into pig iron and another part into synthetic scrap (hot metal that has been run through a Bessemer converter and cast in ingot form.) But the biggest part of the increase has gone directly into openhearths.

Republic Steel in Cleveland is regularly using up to 75 pct hot metal in its openhearths. J & L hits 78 pct. Another major mill is believed to go well over these figures.

The Price Factor — Up to a point, hot metal has several advantages over scrap. The iron cost of an integrated mill is estimated somewhere around $35 or $40. When No. 1 heavy melting scrap was bringing over $60 last year or even over $50 this spring, there was a clear-cut economic advantage in using as much hot metal as possible.

Now the same grade of scrap is down under $35 a ton. In some cases it may be cheaper than the bookkeeping charge for hot metal. However, the mills must consider a number of factors before they start shutting down blast furnaces and buying scrap. These include personnel layoffs, ore disposal, and furnace damage.

More Headaches Loom—If all this did not give scrap men enough to worry about, they must also consider the possibility of a permanent rebalancing of metallics through technical change.

(Bethlehem Steel photo, below.)

Scrap Versus Pig Iron

Is the Trend Toward More Hot Metal?

	CONSUMPTION—TONS (000)		
	SCRAP	PIG IRON	RATIO
1956	71,902	66,968	52/48
1957			
Jan.	6,630	6,482	51/49
Feb.	6,038	5,860	50.8/49.2
Mar.	6,294	6,155	50.6/49.4
Apr.	5,816	5,856	49.8/50.2
May	5,753	5,863	49.5/50.5
June	5,431	5,672	48.9/51.1
July	4,897	5,559	46.8/53.2
Aug.	5,299	5,770	47.9/52.1
Sept.	5,034	5,646	47.1/52.9

Source: Bureau of Mines.

Ready, Set, GROW... with

Imports Hit Oil Country Market

But Long-range Forecasts Paint Bright Picture

Italian and Canadian mills offer casing and tubing at below U. S. Price.

Japanese producers also show signs of getting into the act.

Buildup of user inventories depletes order backlogs, clouds early '58 outlook. — By K. W. Bennett.

■ Foreign steel, always a hoodoo when the tempo of world business slows, begins to cast a shadow across the oil country goods outlook. Within recent days, Italian casing and tubing has been offered, delivered Houston, at $10 under the Pittsburgh-plus-barge U. S. price. Almost at the same moment, a pair of bargeloads put in their appearance from a new Canadian producer, at $2 per ton under the U. S. price for comparable materials.

The flip-flop switch of foreign tube producers has come almost overnight. In January oil country goods were tight, and U. S. tubing and casing users paid premium prices for foreign material. When overseas demand slackened recently (60 days ago), foreign manufacturers came off their premium price horse, now eye the U. S. oil country market with attentive hope.

Long-range Outlook — Although the U. S. has doubled its output of oil country casing and tubing in the past 10 years, the U. S. market has seemed insatiable. Long-range forecasts call for 82,000 wells drilled per year by 1965. Even at present well depths, this would call for well over 3.5 million tons of casing and tubing. Wells drilled this year will total about 58,000, a slight drop from last year's 58,160. Forecasts for '58 indicate drillings will hold to around this year's level.

But as the U. S. has beefed its oil country output, foreign producers on this side of the Iron Curtain have gone from three mills to seven. One oil economist rates their output potential at 750,000 tons per year.

New Foreign Mills — To these must now be added the new Mannesmann mill at the Sault; a new Italian mill; a new French mill; a new German mill; a new Venezuelan mill, and a new Japanese mill. A proposed Mexican mill has at least reached the talk stage.

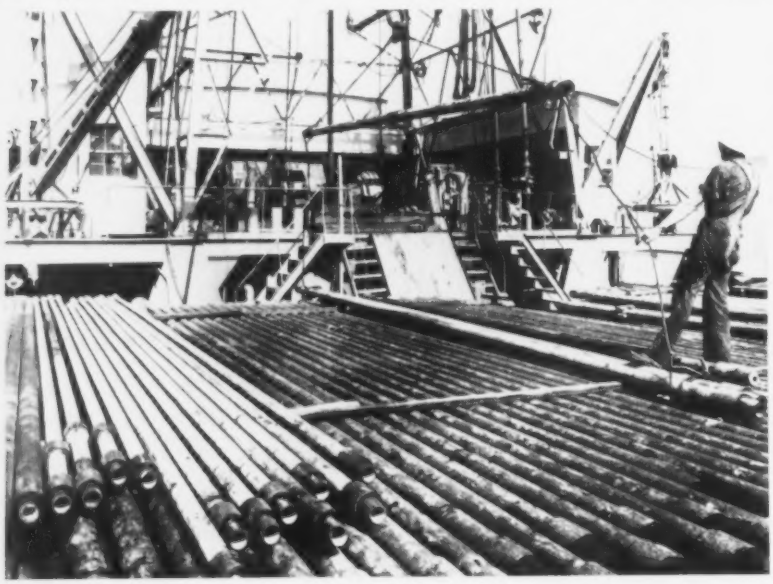
The Japanese, for example, have not discussed price generally, but it is positive that their loss of Canadian markets will force them to attempt to sell casing and tubing in the U. S.

U. S. Advantages—U. S. salesmen point out they have two sales points that weigh heavily against foreign oil goods suppliers. (1) U. S. material has an excellent history of uniformly high quality, and (2) foreign suppliers are traditionally a weak reed in a shortage period. U. S. drillers want to know they are maintaining a historical buying pattern with a constant supplier.

Nonetheless, small drillers have been having money troubles. There's no doubt that the new cut-rate foreign prices will seem attractive. Many oil men point out, too, that in the latter 1930's German oil country steel was offered here at bargain-basement prices as that nation sought to boost its dollar reserves. A number of companies attracted by the price included some drillers of considerable size.

Canadian Tariff?—The stepped-up foreign competition is beginning at a time when Canada seems likely to clamp a tariff wall on U. S. tubing and casing, slashing a rapidly-developing U. S. export market.

What's being done? At least one bill is under discussion to put oil country imports on a quota basis. The idea, proposed by an Eastern Congressman, is being studied.



THREATENED: With the export market already threatened by foreign competition, U. S. producers of oil country goods are hard-pressed to hold their U. S. markets. Import prices are already lower in some areas.

For fractional to 40 hp drives . . .

Ready, Set, GROW... with

The *economical* way to make your products strong, light and handsome is with Revere Aluminum Sheet. Economical because aluminum is so easy to handle and process, can so readily be given a surface finish of distinction.

Revere can serve you promptly now from plants in the East and Mid-West, and soon will be fully integrated as a primary aluminum producer. Revere Copper and Brass Incorporated. Founded by Paul Revere in 1801. Executive Offices: 230 Park Avenue, New York 17, N. Y.

Revere Aluminum Mill Products include coiled and flat sheet, both plain and embossed, circles; blanks; Tube-In-Strip; extruded products; seamless drawn tube; welded tube; rolled shapes; electrical conductors; forgings; foil; frozen food containers. Write for new illustrated booklet on Revere Aluminum Sheet. Free!

Hard Sell Ahead For Used Tools

For fractional to 40 hp drives . . .

SPROCKETS and CHAIN

. . . at Factory Prices

Catalog No. 56 lists

ANY TYPE OR SIZE YOU NEED

.81" to 38.20" P.D.
SPROCKETS, iron and steel, for single ROLLER CHAIN

1.92" to 26.74" P.D.
SPROCKETS, iron and steel, for double ROLLER CHAIN

¼" to 2½" P. **ROLLER CHAIN** single, double, and triple

1.94" to 12.74" P.D.
SPROCKETS, iron and steel, for BLOCK CHAIN

⅛" to ½" w. **BLOCK CHAIN**

.37" to 6.07" P.D.
SPROCKETS, bronze and steel, for LADDER CHAIN

.185" to .353" P. **LADDER CHAIN** brass and steel

SHOLD-A-GRIP
interchangeable tapered SPROCKETS and BUSHINGS
2.09" to 23.88" P.D. SPROCKETS adaptable with tapered BUSHINGS to shaft sizes ½" to 3" by 16ths

BORED-TO-SIZE
ready-to-install SPROCKET PINIONS
Complete with keyway and setscrew, ⅜" through 1" P., in 76 tooth sizes, with 321 stock bores

You get BOSTON GEAR top-rated quality and lasting economy. You save time and expense when you buy from local stock — *at factory prices.* Be cost-wise — standardize. Boston Gear Works, 72 Hayward St., Quincy 71, Mass.

CALL YOUR DISTRIBUTOR

For nearest Distributor LOOK UNDER "GEARS" in the 'Yellow Pages'

7124 "OFF-THE-SHELF" TRANSMISSION PRODUCTS **FROM STOCK** — AT FACTORY PRICES — ASK FOR CATALOG
Stock Gears • Sprockets and Chain • Speed Reducers • Bearings • Pillow Blocks • Couplings

Hard Sell Ahead For Used Tools

▪ Used machinery dealers are facing up to the realities of a buyer's market. Some 70 of them, gathered in New York's Hotel Savoy-Plaza last week for their annual fall meeting, took a hard look at their current problems and opportunities.

Inventories High—Dealers generally admitted the bloom is off the market and hard selling lies ahead. Indications are that the '58 market will probably be less active. So far, however, dealers say sales of used machine tools have not slid off as much as have new machine tools.

But troublesome to many dealers is the fact that their own inventories are high — higher in some cases, than they have been for a long time.

Study Surplus Question — The MDNA's governmental affairs committee is cooperating, together with new machine builders and distributors, in analyzing problems surrounding disposal of the government's surplus tools. Questions regarding the number, age, and type of this equipment put on the open market, plus its relationship to national defense needs, make this a knotty problem.

The drive to obtain for used equipment buyers the same tax privileges of accelerated depreciation extended purchasers of new equipment is not dead as far as the MDNA is concerned. Noting that Congress failed to take action on this subject at the last session, the group pledged to continue its campaign for action in this area.

More Export? — Another item slated for action by the association is stimulating the export of used machine tools. Also getting attention was the financing of purchases by used machinery buyers—a subject made more important by the tight money situation. Proposals for centralized processing of financing, possibly on a district or regional basis, in an effort to obtain lower interest rates, were discussed.

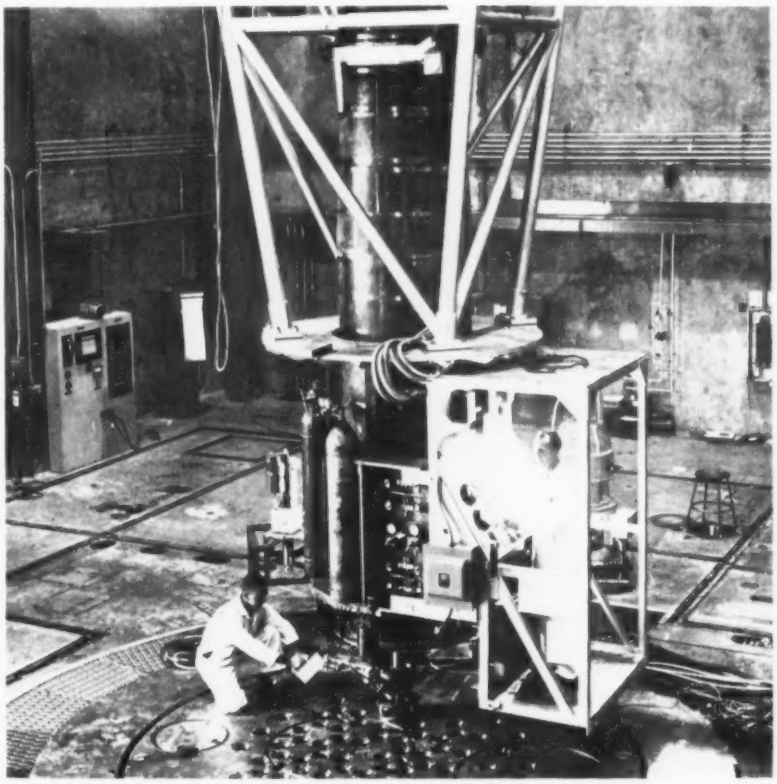
As an aid to member dealers the MDNA is attempting to draw up a glossary of standard terms used in the industry. It's hoped that it will be available by next spring.

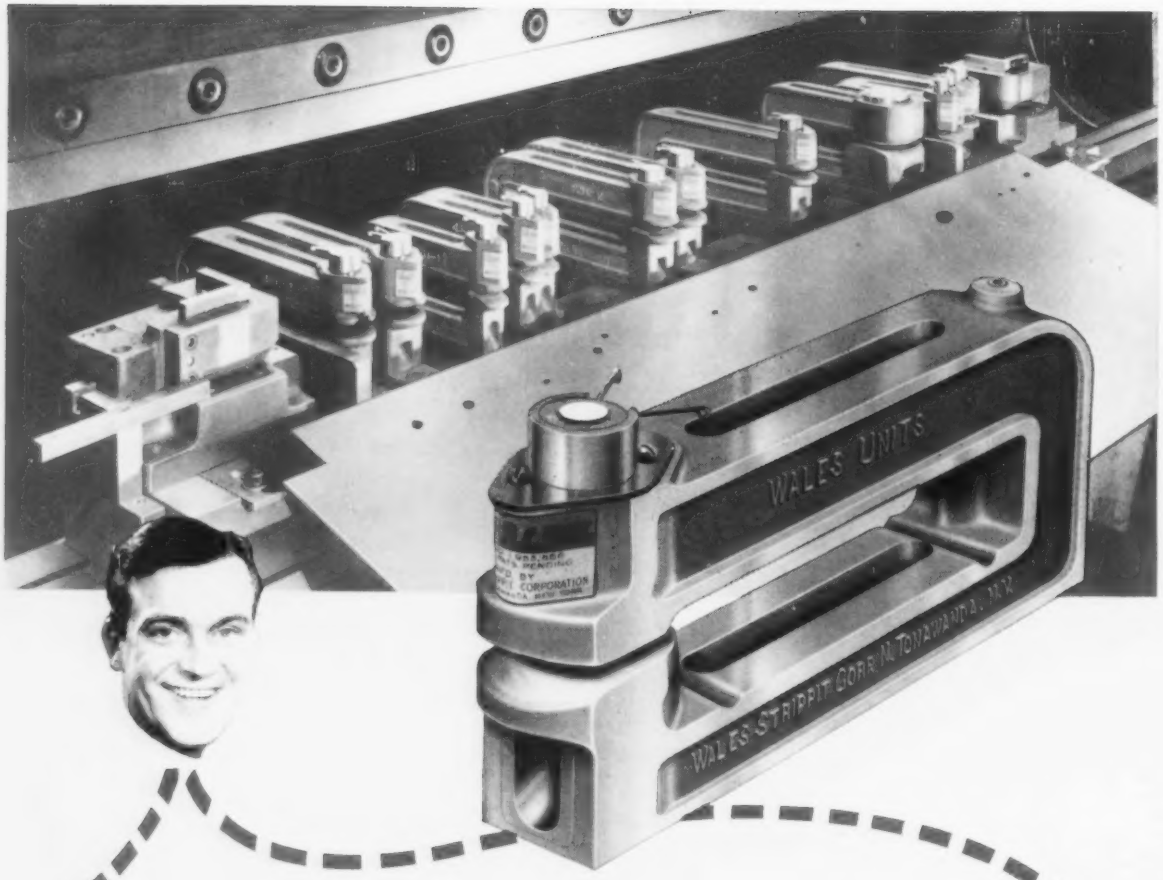
Dealers are better off by-passing the auctioneer when they acquire plants for liquidation, one member told the meeting. The speaker suggested dealers try more plant liquidations on their own. Almost always, he claimed, they'll find the process less expensive, and the prices obtained higher.

SRE Aims for Economical Atomic Energy

▪ Sodium Reactor Equipment is a $16 million project. The program, centered around an experimental nuclear power plant, is expected to provide data that will make possible the economic construction and operation of a full-sized unit. Atomics International, division of North American Aviation, is running the experiment for the Atomic Energy Commission.

The power plant is a sodium reactor. Energy from uranium that has been lowered into the heart of the reactor (photo) is transferred to liquid sodium. In a heat exchanger the energy is transferred to a nonradioactive sodium circuit, and eventually yielded to generating equipment. The reactor has powered electrical turbo generators.





"WALES BL TOOLING SAVES US ABOUT HALF THE COST OF HOLE PUNCHING"

"WALES BL tooling is fast and accurate in our shop. Punches, dies and stripping mechanism are all contained right in the tooling, so our presses have a minimum of down time for change-overs. BL's are just about perfect for punching stock up to $\frac{1}{8}$" thick and we get any type of pattern needed with the same units."

Nothing is attached to the press ram. Alignment of punch and die is permanent.

Notching equipment may be used in the same set-up.

Inventory is kept down and PRODUCTION UP!

A good buy for any shop.

WALES Strippit COMPANY

A UNIT OF HOUDAILLE INDUSTRIES, INC

AKRON, NEW YORK

WALES-STRIPPIT OF CALIF., SOUTH GATE, CALIF.

WALES-STRIPPIT OF CANADA LTD., HAMILTON, ONT.

"...the Wales-Way is the PLUS-PROFIT way"

SEND FOR BULLETIN No. 14-K

The complete story of BL tooling is here for the asking. Send for your copy today.

WALES MOBILE FIELD UNITS

Let us arrange for a Field Unit to visit you. Send for details.

G. LaMonte Weissenburger

A Mental Tonic for Executives

Many a businessman has lost touch with the outside world because he is too busy.

As head of a metals firm for 20 years, Mr. Weissenburger has helped build it into a strong competitor.

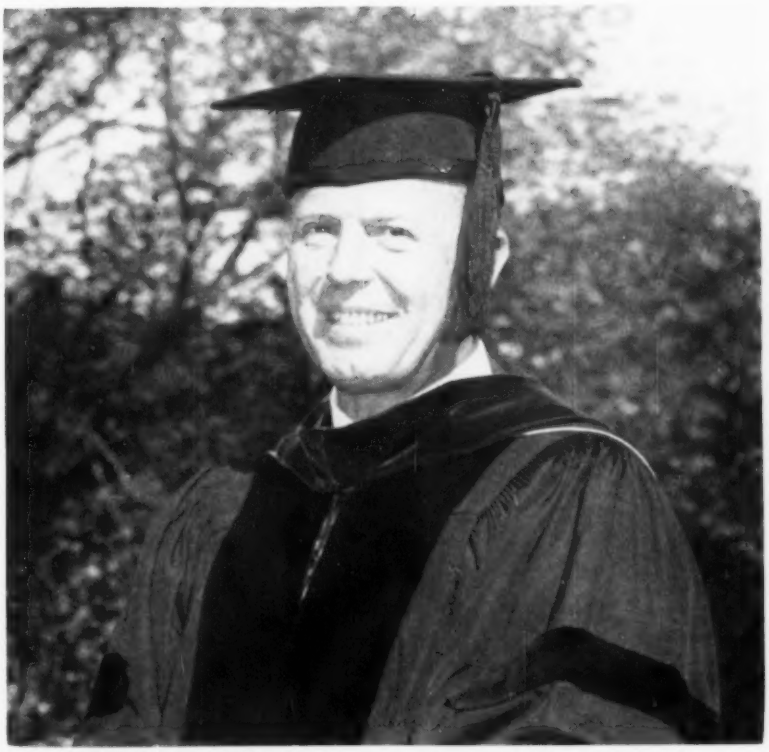
Yet at the same time, he's been able to give valuable service to his community.

▪ The executive who shuts himself up in his own little world of business is making a serious mistake, says G. LaMonte Weissenburger, one of the busiest businessmen in Iowa.

"I'm convinced that in today's complex world, the responsibilities . . . of an executive must include those of broader social implications than are found in business," he says. "Outside activities not only broaden the man," he explains, "they hold the answer to his spiritual needs. They give him hope for the future."

A Doer—This idea of getting out of the office once in a while is not a new one with "Monty" Weissenburger, who is president of Keokuk Electro-Metals Co. At one time or another he has been a member of the Iowa Development Commission, Iowa Manufacturers Assn., Quad-Cities Post of American Ordnance Assn., and a trustee of Parsons College.

He is also regional vice president of the National Assn. of Manufacturers. The list goes on through local business groups, service clubs, and county politics. During World War II and the Korean conflict, he served as a member of the WPB Ferro Alloys Advisory Committee.



G. L. WEISSENBURGER: A busy man is most likely to succeed.

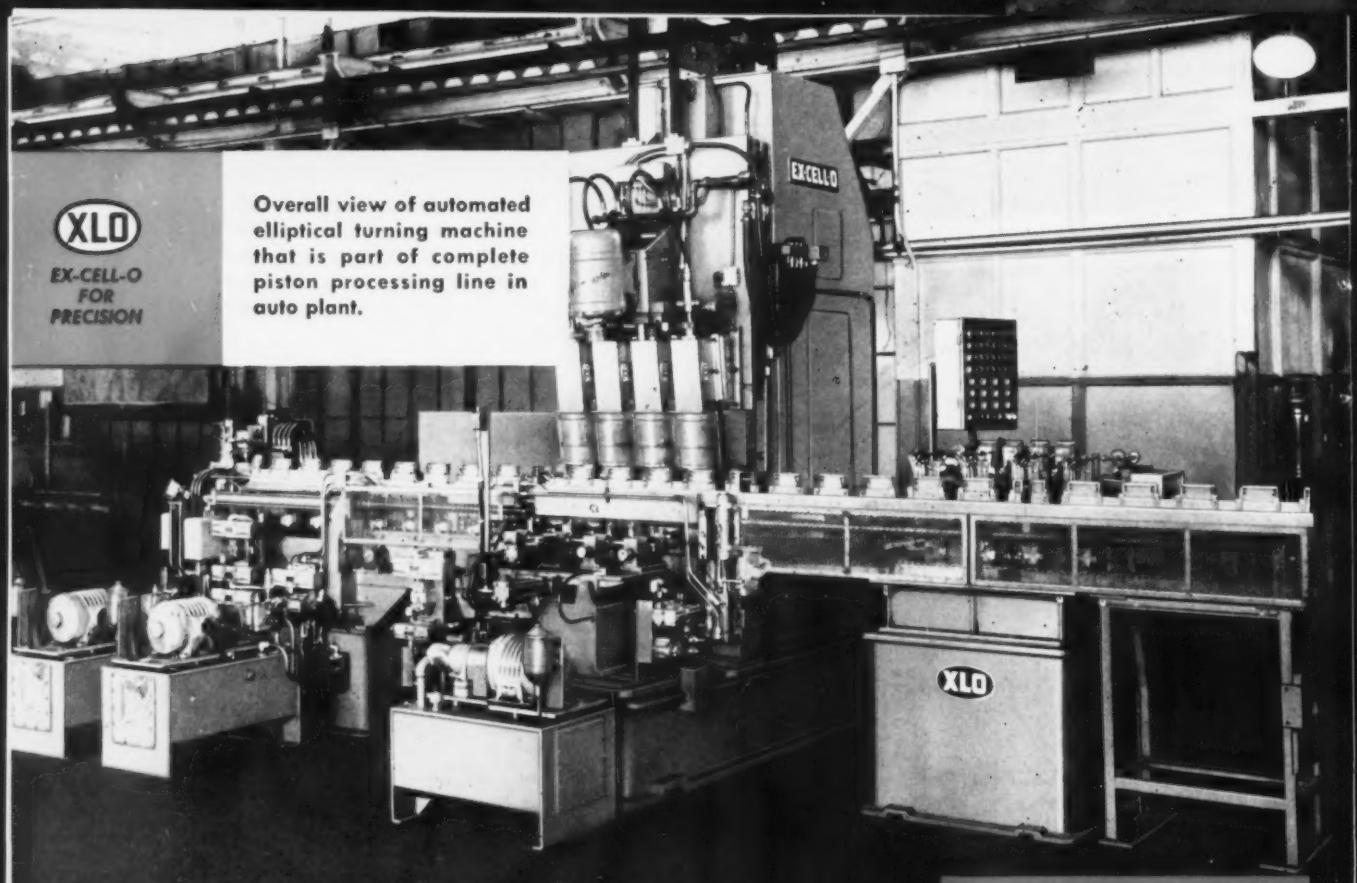
His Firm Prospers—If you are asking yourself, "When does this man find time to run his business?" here is the answer: Under Weissenburger's presidency, Keokuk has become one of the world's largest producers of silvery pig iron. In 20 years, sales have gone up twelve-fold. Corporate net worth is 800 pct greater. Production capacity is seven times larger.

Monty Weissenburger himself has no secret formula to reveal. Any contribution he has made to Keokuk, he says, has been in the nature of "horse sense."

Perhaps the secret lies in a willingness to let assistants take on a bigger share of the work load.

A One-Company Man — He learned about his business early and from the ground up. While still in school, he worked summers at Keokuk Electro as a laborer and as assistant chemist. Within three years after graduation as a mechanical engineer from Cornell University, he was named secretary of the company. Seven years later, in 1934, he was named secretary and assistant treasurer. And since 1937 he has been president and treasurer.

Whether most executives could plunge as deeply into outside activities as Mr. Weissenburger is open to question. Those who barely find time for an occasional round of golf, however, would find him a formidable competitor on the fairways, too.



XLO
EX-CELL-O FOR PRECISION

Overall view of automated elliptical turning machine that is part of complete piston processing line in auto plant.

Roughs and Finishes 250 Pistons per Hour

57-77

This automated Ex-Cell-O machine semifinish and finish turns an elliptical shape on automotive piston skirts at the net rate of 250 pieces per hour.

Pistons enter the machine from a conveyor, are radially located from their wrist pin holes and clamped on the ring land diameters. Four heads machine four piston skirts simultaneously. Air gaging follows the machining operation, after which pistons are ejected to another conveyor.

Write to Ex-Cell-O or contact your local representative for further information or a proposal.

EX-CELL-O CORPORATION *Machinery Division*
DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS • GRINDING AND BORING SPINDLES • CUTTING TOOLS • TORQUE ACTUATORS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

Get Ready for Rough Treatment

You won't like it, but you'll find conditions changing in the business world.

The slight decline has made the customer a tough man to handle. He'll be after better service and savings if possible.

▪ You will have to adjust to a changed business climate in the months ahead.

This means more than revising your thinking to a moderate decline in business. The tougher competition for slightly smaller markets means not only less business but a new way of doing business.

Sharpen Pencils—You will find your customers, even old friends, with a changed attitude. They will demand the best service, maximum results, and price shavings if possible.

This changed attitude will come as a shock to the many businessmen who have been riding on fat backlogs for months, or even years. To those who have been fighting tough competition, it will mean little change.

Close Checks — Emphasis throughout business will be on cutting costs—any way possible. It will mean smaller inventories, fewer frills, closer look at all costs, from expense accounts to broad departmental budgets.

Executives will take a close look at any item, whether it's a service or a purchased product. First question: Do we need it at all? Second question: Can we get it (or get it done) cheaper? And third: What are they doing for us?

You will have to defend your product or service on both counts. At the same time, your company's attitude to its suppliers will also be subject to the same forces.

Don't Overdo It — Your own management will demand the closest kind of procurement, and will tolerate no nonsense from its purchasing department, and demand the most from its suppliers.

It will be tough going, of course. Inflexible or escalator-tied labor costs and higher prices on parts and commodities make price shaving next to impossible.

A word of caution: Don't get too tough. Remember, a slight leveling is not a recession and an injury to established relationships between companies is a serious things.

Will New Factors Fill the Gap?

No Upturn—On general business conditions, about the most to be said is that the fall upturn did not materialize as expected. And there are few concrete indications of any upturn after the first of the year.

Present level of business will probably continue for some months. Pessimists point to the tapering off in capital spending as an evil portent. Optimists look hopefully at a possible upturn in home building and state and local government spending as the elements to fill in the gap.

No Defense Fever—Even after the President's speech last week, few industrialists appeared to take the new attitude toward defense and security into their business thinking. Exceptions are those directly affected in the missile program.

After all, it's hard to take an intangible item like research and development and translate it into machine tools, steel sheets and refrigerators.

Sooner or Later—But as pointed out by Eliot Janeway (The IRON AGE, Nov. 14) money pumped into the economy for any purpose can sooner or later result in increased consumer spending, or at least consumer income.

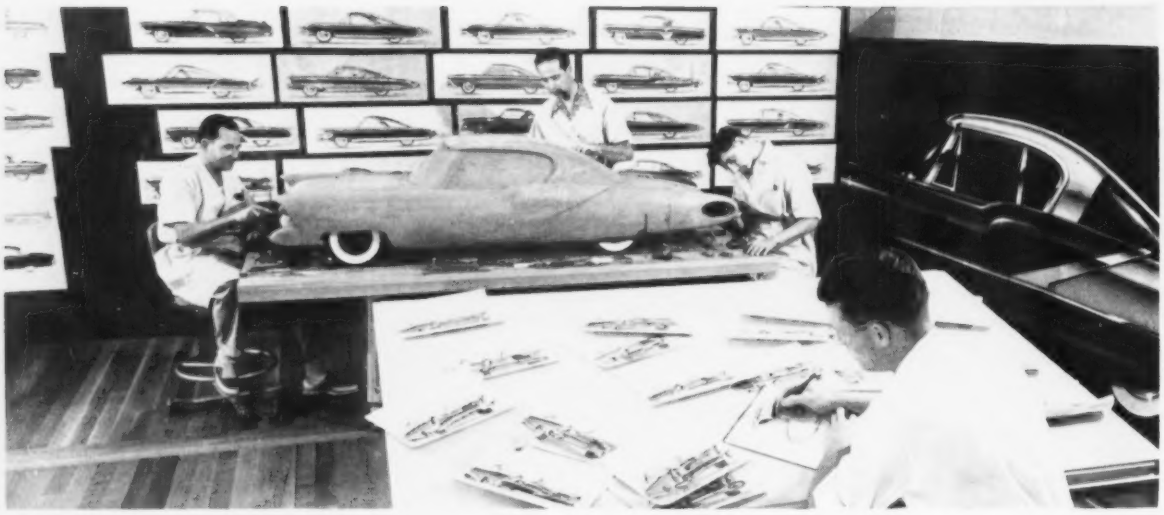
A third element to be considered is the probability of easier money. It's difficult to estimate how many programs were halted by difficulty in obtaining financing. Easier money could re-initiate them, unless they are scared off by the recession talk.

Inventories Can Hurt

Still High—You can still get hurt by inventory cutbacks. Some industries are already pared to the bone, but the overall level is high.

Manufacturing inventories stood at $54.1 billion at the end of September. This is down slightly from $54.2 billion in August, but higher than the level of $53.5 billion a year ago. Most of the increase is in higher replacement costs, however.

Meanwhile, sales are on the downgrade. Manufacturing sales dropped from $29 billion in July to $28.2 billion in September. Durable goods industries sales dropped from $14.6 billion in July to $14.1 billion in September. In 1956, durable goods sales totaled $13.4 billion for the month of September.



INNER SANCTUM: Behind locked doors protected by guards, Ford designers create cars of the future.

How Ford Guards Auto Secrets

Hiding ideas from the prying eyes of competitors is a serious business in Detroit.

At its new styling center, Ford uses up-to-date cloak and dagger tactics.—By H. R. Neal.

■ Guarding the secrets of future car styling is almost as much an obsession with automakers as military atomic security is with the government. Carelessness, loose tongues, and deliberate spying are major problems to both.

An example of the lengths automakers go to maintain styling secrecy can be found at Ford Motor Co.'s Dearborn, Mich., styling center. Ford security is aimed at reducing the number of people allowed to see any given model during its development. This includes the non-professionally interested buying public as well as the professional "spies" of the other car makers. Another security measure is educating employees to avoid "incautious" conversation and gossip about their work.

Badge Identification—How does Ford maintain secrecy when a large number of "outsiders" have legitimate business at the styling center? Principally, a visible badge system is used, similar to that employed on military installations. Color-coded badges, with photograph, indicate the area he is authorized to enter.

An Edsel-hued badge can't enter the Mercury-tinted area. This compartmental control, of course, applies to employees. The basic reason is simple: What one department is doing is none of the other's business.

Escort Service—Visitors to the styling center are subject to what Ford calls "perimeter control." It begins at the main entrance to the building. In the lobby he is screened by a receptionist "under the watchful eye of a guard." The receptionist finds out his name, firm represented, the person he wishes to see and why. The information is put on a pass that the visitor must carry while in the building. Next, he is met in the lobby and escorted to the particular person or department. When his business is finished, he is escorted back to the lobby.

Another safeguard: All locks used in the styling center are assembled within the building. Removable cores make it possible to change every lock within an hour. All locks are combinated and all keys are cut by members of the styling security force.

Lip Locks Needed—An even greater problem is preventing employees from talking about what they have seen or what they have been working on. As George W. Walker, vice president and director of styling, put it, "We obviously can't brainwash our employees." But if an employee makes up his mind that he's going to talk, at least we can make sure that he sees only what he has to see in the course of his work."

One step in combating "loose tongues" has been a program of weekly posters making employees aware of the need for secrecy.

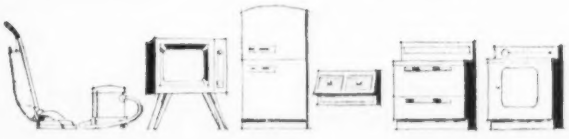
Trash Tells Tales — Locked

Look to the

LAMSON

"Horn of Plenty"

FOR ASSEMBLY LINE FASTENERS!

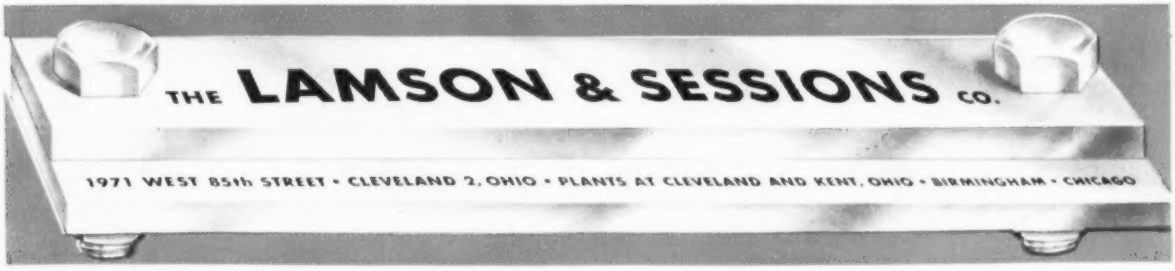


FAST DELIVERY from Stock on Hundreds of Types and Sizes

The life-blood of any production line is the steady flow of quality fasteners. Any delay in delivery, or fastener failure during assembly, can bring the entire line to a costly halt.

Make sure you are protected at every vital point of assembly. You can always rely on Lamson & Sessions to see that the best of fasteners are delivered where you want them, when you want them!

Send for your FREE STOCK LIST



There's a Good Reason why

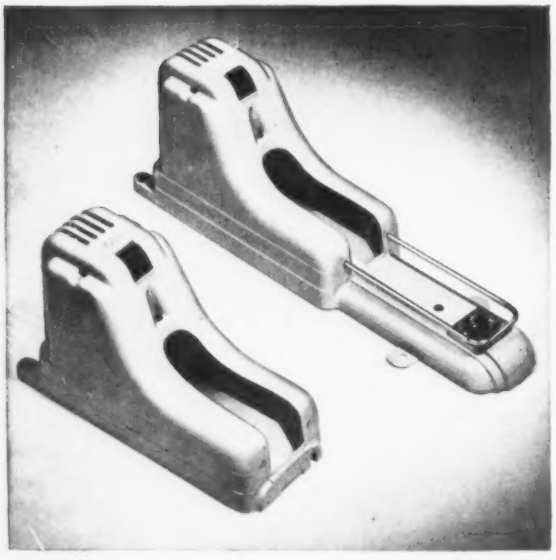
ZINC DIE CASTINGS

are so widely used . . .

at *Swingline*

IT'S FLEXIBILITY

TWO DIFFERENT MODELS OF THE SAME MACHINE FROM THE SAME DIE!



—including inserts, mounting studs, holes and projections that save so much time in assembly.

Both of these housings for the SWINGLINE feather-touch electric stapler were made in the same die by using a cut-off section to eliminate the long anvil of the standard model. The short stapler is for industrial, laundry and dry-cleaner use.

This FLEXIBILITY of die casting with ZINC offers a great variety of time-saving and money-saving advantages — almost certainly some that can be applied to your products. See your die caster and get his advice.

THE NEW JERSEY ZINC COMPANY

160 FRONT STREET • NEW YORK 38, N.Y.

HORSE HEAD PRODUCTS ®

Automotive Production

WEEK ENDING	CARS	TRUCKS
Nov. 16 1957*	144,627	22,573
Nov. 9 1957	136,742	22,643
Nov. 17 1956	135,641	21,510
Nov. 10 1956	132,087	21,190
TO DATE 1957	5,320,200	967,000
TO DATE 1956	4,946,500	984,600

*Preliminary Source: Ward's Reports

wastebaskets are used for restricted material. Contents are emptied and burned under security supervision. In addition, a member of the security force accompanies all models to be scrapped. He watches while they are demolished by a bulldozer.

Prying eyes from the outside also receive attention. The styling center is set back 200 yds. from adjacent public roads. As if that isn't enough, a 60-power telescope is used to spy for spies. Members of the security force not only train it on areas outside company property but on nearby company buildings as well.

Results—But just how effective are these security measures?

A Ford spokesman admitted it's difficult to weigh their effectiveness. He suggested, "it might be better to ask that question of our competitors." He did say it has never been necessary to change all of the locks in the styling center in an hour. In fact, a switch in locks has been made but once—and then only as a precautionary measure. It was done during the Edsel press preview in August, he said.

"We had to relax restrictions a little then so the ladies and men attending the preview functions would encounter fewer difficulties in reaching the washrooms." After a thoughtful moment he said: "We thought this only proper."

Human Weakness—By and large, physical security is probably close to being leak-proof. But, as pointed out before, leaks develop around the human element. So far, no way has been devised to keep members of technical societies from talking to each other. Invariably, they swap ideas. A few cocktails before dinner-meetings is seldom recognized as a sure way to plug the holes, either.

Stylists and engineers in the auto industry often move from one company to another. As might be expected, they carry their knowledge with them. According to the Ford man, however, a "gentleman's agreement" exists between the auto makers, and new employees are not "pumped" for all they know. Pumped or not, they are undoubtedly a prime source of information for the new employer.

The Professional Spies — The Ford man's suggestion to ask competitors for evaluation of their security was hardly facetious. Each auto company maintains a small but effective espionage group. The purpose, naturally, is to ferret out the others' secrets.

These groups are fairly successful. Pictures, particularly, are obtained in ways approaching the cloak and dagger routines of TV drama. But these usually come from the vast proving grounds and backroads testing of cars, making it much harder to guard against.

In short, a lot of information might leak to a lot of people in one form or another—but Ford doesn't make it easy for the seekers.

GM Regains Ground In Sales Battle

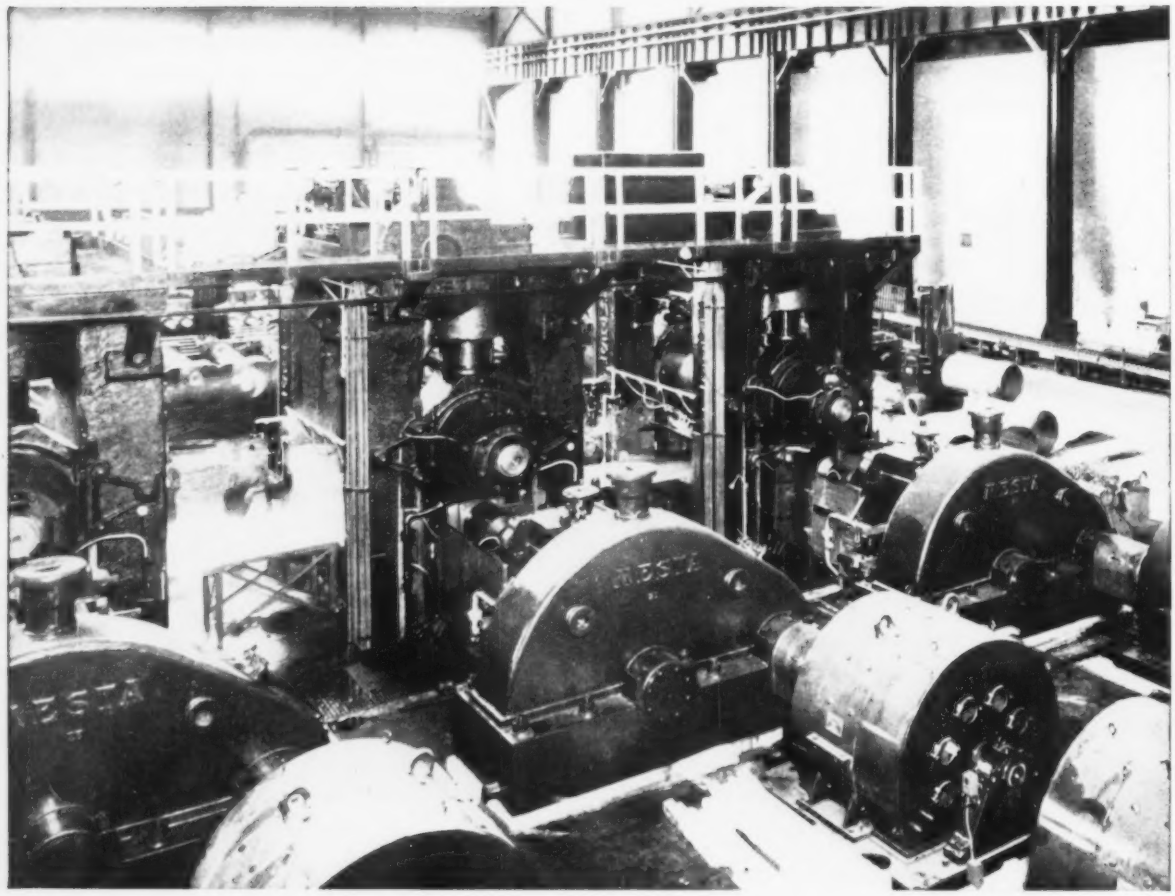
Chevrolet put on a September sales spurt that saw it take the No. 1 spot for the month from Ford for the first time. At the same time, it shaved Ford's end-of-August lead of 49,000 units by 2000 to 47,000 and added 1.08 pct to its market penetration figure for the nine months.

Total industry registrations for the nine months amounted to 4,601,195, compared with 4,612,825 in the same period last year.

September figures also saw Chrysler Corp. slip slightly from its August share in the face of gains chalked up by both Ford Motor Co. and General Motors. However, for the full nine months period Chrysler Corp. still shows the greatest gain of 3.41 pct in market penetration in comparison with 1956.

THE BULL OF THE WOODS — By J. R. Williams

NO, IT DIDN'T BREAK TH' SKIN! IT JUST BRUISED IT A LITTLE!
I SEEN TH' CLAMP BREAK LOOSE, BUT I DIDN'T THINK IT WOULD FLY LIKE THAT!
WHEN I WAS A KID, MY OL' MAN WAS MY GREATEST HERO, TILL TH' NIGHT OF TH' FIRE, WHEN HE JUMPED OUT OF A WINDOW AN' TH' TAIL OF HIS NIGHTSHIRT CAUGHT ON A NAIL! EVERY TIME I SEEN HIM AFTER THAT I'D THINK OF HIM TRYIN' TO GIT OUT OF THAT NIGHTSHIRT!
IT DOES TAKE SOMETHIN' AWAY FROM A KING TO LET PEOPLE SEE THAT UNDER TH' ROBE OF DIGNITY IS TH' SHAPE OF A SAND HILL CRANE!
THE KING'S HORSES
© 1957 by NEA Service, Inc. T.M. Reg. U.S. Pat. Off.



PROTECT REDUCTION GEARS

against Heaviest Loads

It's the polar additives in *Texaco Meropa Lubricant* that *keep* it clinging to gear teeth and bearing surfaces even when gears are working under severe conditions of heat, pressure, or moisture.

What's more, the extreme pressure properties of *Texaco Meropa* give it a tougher, longer lasting lubricating film that effectively protects against shock or heavy steady loads. And it resists oxidation and thickening—won't foam or separate. All good reasons why gears run smoother, last longer, and maintenance costs stay low.

There is a complete line of Texaco Lubricants designed to help you get the most efficient performance from your equipment. A Texaco Lubrication Engineer will be glad to suggest those best suited to your needs. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Meropa Lubricants

FOR STEEL MILL GEAR DRIVES

What's Ahead in Missile Probe?

Johnson Gets His Own Ammunition Ready

Sen. Johnson hopes to learn why U. S. lags, what can be done to regain lead.

One major result should be orders to armed forces to end duplication in missile and rocket projects.—By G. H. Baker.

■ The Senate's upcoming investigation of the U. S. rocket-satellite program is being built around these two main points:

Why has the U. S. lagged so far behind Russia in developing missiles, rockets, and earth satellites?

What needs to be done to put the U. S. back in the lead? More research contracts? Federal insistence on science classes in grade and high schools? Federal funds for scientific education?

Johnson Ready — Senate Majority Leader Lyndon Johnson, D., Tex., has assumed personal direction of the investigation. And he has retained the services of Edwin L. Weisl, a New York attorney, to act as special counsel to the investigation. Public hearings start Nov. 25.

Senator Johnson says these four guideposts will mark the course of the inquiry:

These are times requiring the leadership of strong men.

Feeble denials of facts will not strengthen the U. S.

Timid minds will not produce bold ideas.

Hesitant souls will not win the contest to control outer space.

Probable Results — And here's what is likely to result from the investigation:

The armed services will be ordered to stop duplicating and triplicating each other's missile and rocket projects.

Tax deductions will be authorized for engineering and scientific education.

More dollars will be appropriated for federal research into missiles, rockets, and space travel.

Local school boards will be urged to scrap some of the frills of "progressive education" and to reinstitute compulsory mathematics, physics, algebra.

Brace Yourself for Line 6-A

Where It Hurts—Line 6(a) on the new federal income tax return is causing almost as much pain as an outright tax boost.

To some employees in industry, filling in this item will hurt as much as meeting a higher tax rate. For Line 6(a) has been added to the tax form to report amounts claimed to cover entertainment and other expenses in 1957.

Nothing New—Internal Revenue Service confesses it is surprised at the attention centered on this addition to the tax return. In its own defense, the agency recalls that reporting of individual expenses has been required in some form since 1921.

But those employees with few expenses seldom have bothered to put down outlays for which they've been reimbursed. Now, though, they're told they must show the amount they spent on company business. While the reimbursement is shown as income, this amount is cancelled out as a business-expense entry.

Work for Accounting — Company treasurers foresee more work in the making, as employees ask for summaries of the expenses vouchers they submitted.

On this score, the IRS offers some reassurance. Its agents are instructed that expenses itemized to the final penny are not necessary. An applicable Internal Revenue ruling points this out as an example:

Where a taxpayer makes a claim for travel expenses, he need not offer documents to prove each portion of the claim. He can pinpoint public transportation costs, IRS contends, and get a close estimate on car operation outlays, if he drives his car. Then, for meals, lodging, tips, and the like, IRS will accept a "reasonable approximation."

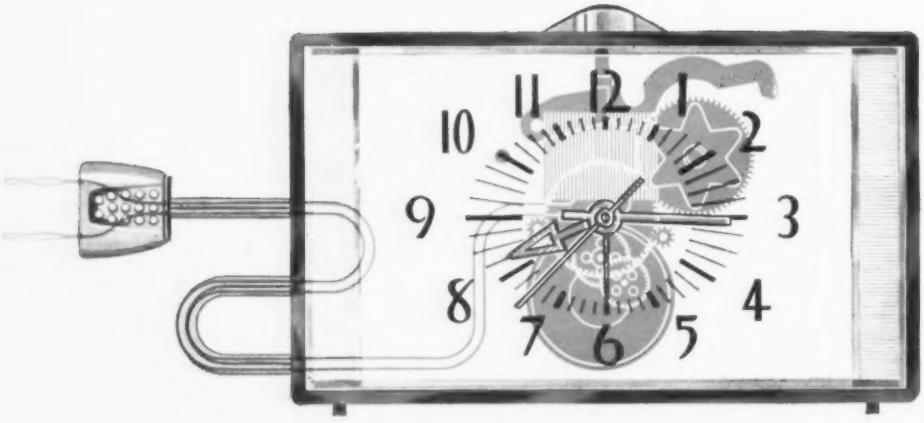
Two Targets—The agency frankly admits it is curious about the returns from employees in two types of concerns. In one group are small, closely-held companies, and in the other are very large businesses.

In both types, an employee may be issued a flat sum per month, on which he can draw for expenses. IRS wants to be sure the employee isn't merely picking up additional income by pocketing some of it.

As a general policy, the agency is not taking a tougher line with taxpayer expense claims than it has done earlier. Most claims will be dealt with next year as they were this year and last.

A modern electric clock by General Electric Company, Clock and Timer Department.

Add COPPER



. . . to keep America on time!

Almost any clock requires Copper to run accurately. For one thing, Brass (an alloy of Copper) can be precision-machined so that gear trains will move at a more accurate rate.

An *electric* clock needs Copper even more.

What other metal could provide Copper's high conductivity? What else could give you 6500 turns of wire in a tiny coil? What else makes delicate springs so durable? What other metal resists corrosion like Copper . . . *indefinitely!*

In a clock, parts made of Copper render service that is timeless.

And you find Copper easier to work. It draws readily to make a case or housing. It swages well to seal oil in a motor. It machines accurately for a high-load bearing. And the higher-cash-value of your manufacturing scrap lessens your raw materials cost.

The Copper Industry will provide ample future supplies to enable you to design with Copper!

COPPER • BRASS • BRONZE

in over 40 Standard Alloys!

For information on the above or any other application of Copper, write to the Copper & Brass Research Association, 420 Lexington Ave., New York 17, N. Y.

San Francisco Avoids Slowdown

Defense Cutbacks Cast No Major Shadow

A well balanced electronics industry is helping keep the Bay Area busy these days.

Employment gains in early fall were made in machine building, fabricating, ship repair. — By R. R. Kay.

■ "Brightest spot on the West Coast," says a San Francisco executive analyzing his city's position following the impact of defense cutbacks and stretchouts in the Far-west. His comment pretty well sums up the general feeling in northern California on the current business outlook.

Lew Holland, manager of San Francisco's Chamber of Commerce industrial department, puts it this way:

"Only a small percentage of the San Francisco Bay Area's business and industry is geared to the defense effort. So government economy moves are casting no massive black shadows here.

"More money is going into missiles which need still more electronics. The beautiful thing is that 90 pct of our metalworking industry is non-defense."

Nice Mix Pays Off—Margaret Thall-Larson, head of California's Department of Employment, says, "We have had no mass layoffs to date—and none are in view.

"Although metalworking employment is settling slightly, it's only in line with the general economy. Electronics industries are feeling a tiny setback during this phasing out period in government contracts.

"We have a highly diversified electronics industry in the Bay Area, a nice mix of work in aircraft, missile, and ground and air signal systems."

Employment High—Chief of California's division of labor statistics, M. I. Gershenson, reports that employment in the Bay Area manufacturing industries in September hit a "peacetime high of 209,400—4500 higher than in the like month a year ago."

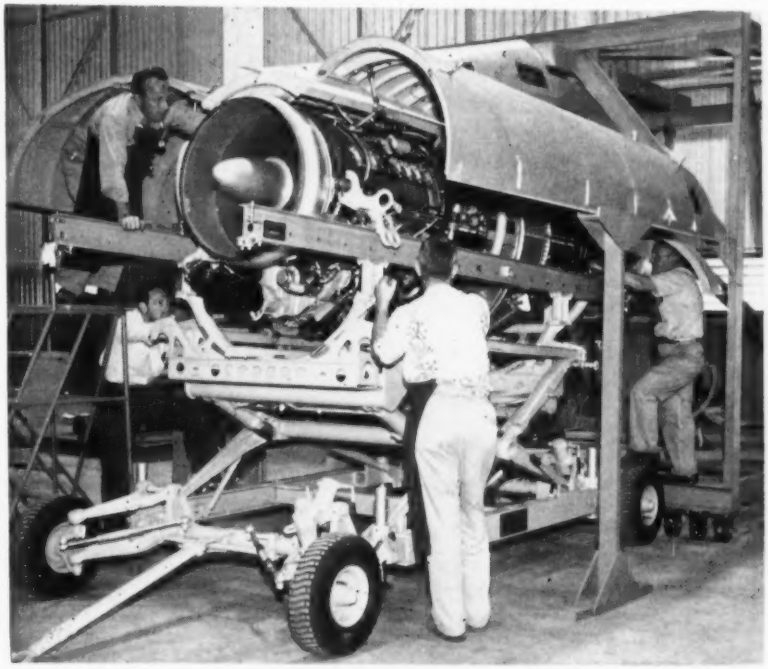
The biggest gains were in machinery manufacturing, metal fabricating, ship repair, and electronics. Though October reports are not yet all in, it looks as if "we may be a little off, but nothing substantial."

Defense Spending Strong—An IRON AGE check of Air Force Procurement, Army Ordnance, and Navy Purchasing backs up these opinions.

"No extensive cuts are in the cards. Most electronic contracts and metalworking jobs are at almost the same level as before," one military aide says. And another agrees: "We have had no cutbacks or stretchouts yet. Everything is going along as usual so far."

George I. Long, president of Ampex Corp., one of the Bay Area's leading electronics firms, predicts "continued substantial expenditures for defense, particularly in missiles."

Quick-Change Artists Hold Rehearsal



FAST SUBSTITUTION: Thirty-minute engine-removal techniques will be standard on new Convair 880 jet transport. Here they are worked out on full-scale model engine pod and engine handling cart.

STONE
MODEL T-20

"Slices" THROUGH STAINLESS STEEL

STONE MODEL T-20

Traverse Cutting Machine pictured at Rolled Alloys Plant, South River, N. J.

•

The patented revolutionary type of stainless sealed-roller ways preloaded, permit long, continuous, trouble-free operation. Has a totally enclosed heavy-duty floating type steel safety guard, parallel work stop gauge and positive clamping device.

This new Stone Model T-20 Traverse-Type Cutting Machine cuts one-inch stainless steel at approximately 3 feet per minute.

The Stone T-20 cuts ferrous, non-ferrous and non-metallic sheet and plate.

CLEAN CUTTING . . . HIGH SPEED . . . ACCURATE

The new Stone T-20 Model is the result of more than three years of engineering. It's the most versatile and rigid completely-hydraulic-operated traverse-type machine on the market today. Each feature of the T-20 is designed for speed and accuracy *with* safety. Hydraulic lateral feed 0-50' speed per minute. The speed of raise and lower of cutting head is from 0-10' per minute. Length of cut 12' with raise and lower 24".

SPECIFICATIONS STONE MODEL T-20

Capacity: 4" ferrous or 8" non-ferrous depending on material. Consult our engineers.
Size: 21' x 8' x 8'
Weight: 12,000 to 14,000 lbs.
Arbor Speed: 2360 RPM (others from 630 to 2900)
Actual Cutting Times: 1" x 10'—3 min., 45 sec.
$3\frac{1}{4}$" x 5'—1 min., 15 sec.
Full 20 H.P. geared-in-head, T.E.F.C., induction type, continuous duty motor
Wheel Diameters: 20" x .150 to .170 (Larger diameters upon request)
Arbor Size: $1\frac{3}{4}$"
Heavy Duty 8" steel wheel flanges. Cuts with an abrasive wheel on ferrous metals, steel saw blade with oil mist spray on non-ferrous.

Write for more information

STONE MACHINERY COMPANY, Inc. 161 FAYETTE ST. MANLIUS, N. Y.

If You Use Electronic Controls—

You Can't Rely on Haphazard Maintenance

New uses of electronic controls for machine tools are developing every day.

But they require thorough knowledge of conditions, and trained technicians to cut downtime.—By E. J. Egan, Jr.

▪ Electronic machine tool controls — for variable speed drives, for translating blueprint data, for gaging, for workpiece handling—find new uses almost every day. But electronic devices raise two important questions:

1. How reliable are they?
2. What does it take to maintain them properly?

The Answers—Speakers at the AIEE's Ninth Annual Machine Tool Conference came up with some interesting answers.

General Electric Co.'s H. L. Palmer admitted that electronic circuits can go out of adjustment. Sometimes they'll fail completely. As any owner of a TV set knows, things happen at the most inopportune times.

These faults don't mean that electronic controls can't be reliable in a practical shop sense. But it does mean that you can't expect 100 pct performance year in and year out.

Many Factors—Any number of things can affect the reliability of electronic machine controls. Overall circuitry can range from very bad to very good considering the work it will have to do. Mechanically, too, these control units can be either soundly assembled and readily accessible for repairs, or they can be flimsily built.

But even a good blueprint blend of electronic and mechanical design might not suit every shop. Dirt, corrosive atmospheres, and high or low temperature conditions demand special reliability insurance. So do operations that involve heavy shocks or lots of vibration.

Technicians Needed — Here's where individual circuit components can work for good, or for evil. Resistors, capacitors, transformers, rectifiers, vacuum tubes —they're all critical items. For top reliability, the experts say to get the best and keep plenty of spares on hand.

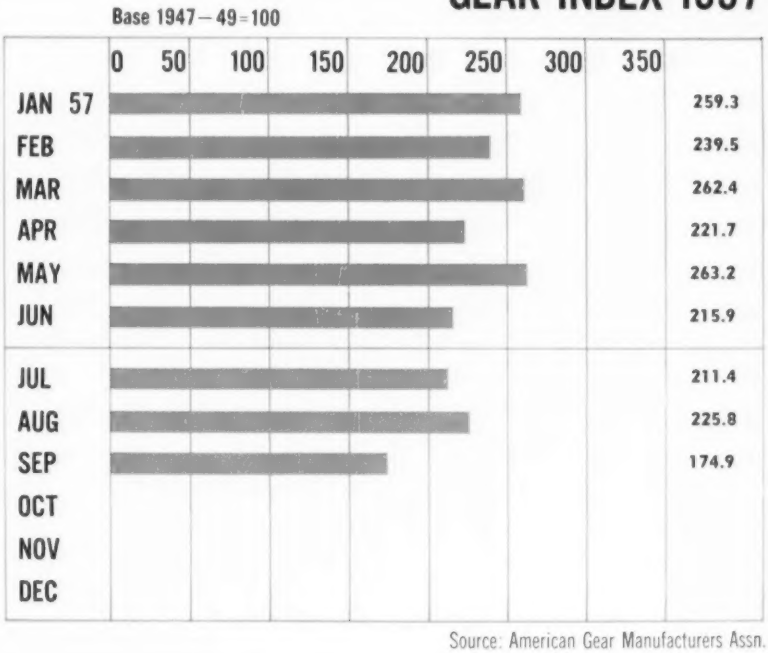
Now—who's to put in the spare parts when they're needed? These little details call for a skilled technician, and he's a scarce article. "This man," says North American Aviation's A. R. Davis, "cannot be yesterday's maintenance mechanic or electrician with just a little more experience and a few more tools."

Training Programs—Both North American and the Boeing Airplane Co. have learned that trained technicians are the only answers to electronic control maintenance.

Boeing starts its selected trainees out in a 600-hour Basic Electronics course. That's 15 solid weeks of classroom and lab work covering everything from an initial 80 hours of math review to a final 80 hours of elementary servo principles.

North American attempts to upgrade the skills of its present mechanical and electrical maintenance staff with a strictly scheduled training program about 200 hours long.

GEAR INDEX 1957



Source: American Gear Manufacturers Assn.

INDUSTRIAL BRIEFS

Ready for Gushers—A modern centrifugal pump production line is in operation at Oil Well Supply Div.'s Wilson-Snyder Works, Braddock, Pa. Equipment in this U. S. Steel plant is designed to permit machining, assembling, testing and shipping of centrifugal pumps in one operation. Housed in a new building 140 ft long, the facilities include recording and metering equipment, balancing machines and special motors to test volume and water pressure.

One Step to Aluminum—International Minerals & Chemical Corp. will supply Kaiser Aluminum & Chemical Corp. with more than 10,000 tons of a fluorine compound annually under a multi-million dollar, five year contract. Fluorine in the form of fluosilicic acid will be reclaimed by IMC from the processing of phosphate chemicals at its Bonnie, Fla., plant. It will be used by Kaiser at its new plant at Mulberry, Fla., in the first stage of producing synthetic cryolite, a vital product in the reduction of aluminum.

On Target — The Navy has awarded a $548,700 contract for 133 small-boat radars to the Raytheon Mfg. Co., Waltham, Mass. The new equipment is a modification of Raytheon's commercial radar "Mariners Pathfinder." It permits the Navy to economically place radar on small amphibious landing craft.

Test and Inspect — Two metallurgical laboratories have been put into operation by Gardner-Denver Corp. One will serve the plants located at the company's headquarters in Quincy, Ill. and the other at the Keller Tool Div. in Grand Haven, Mich. The Quincy lab will concentrate on checking incoming bar stock and analyzing nodular iron, castings, and forgings produced in the Gardner-Denver foundries.

Push and Pull—Sutton Engineering Co. has announced the purchase by Detroit Gasket & Mfg. Co. of a 1500-ton self-contained aluminum extrusion press and a 15 ton hydraulic stretcher and straightener. New equipment is being manufactured at the Sutton plant at Bellefonte, Pa. It will be installed at Detroit Gasket's Extruded Metals Div. at Belding, Mich.

Caribbean Cans—Mass production of cans in Puerto Rico began with the opening of an American Can Co. subsidiary plant at Bayamon. The new facility, to be operated by the Puerto Rican Can Co., is the 500th opened under the Commonwealth's "Operation Bootstrap" program of industrialization. All cans produced by the subsidiary, which has a capacity of 150 million containers a year, will be used by the island's growing canning industry.

All for a Vacuum—Southwestern Engineering Co., Los Angeles, is producing a complete new line of vacuum equipment. This includes surface condensers, steam jet ejectors and an ejector-condenser combination unit. The equipment is employed in many types of process industries and in power plant operations.

Good Judge—M. M. Pavane has been added to the membership of the Award Committee for the Miniaturization Award. Mr. Pavane has had a long association with the fields of miniaturization and electronics. He is currently with the Headquarters Div., Air Research and Development Command, New York Air Force Development Field Force.

Merger Approved—Shareholders of Copperweld Steel Co. and Superior Steel Corp. have approved the merger between the two companies. It is expected that the merger will become effective Nov. 30, 1957. Copperweld will be the surviving corporation, operating Superior Steel as one of its divisions. C. I. Collins, will be vice president in charge of the Superior Steel Div.

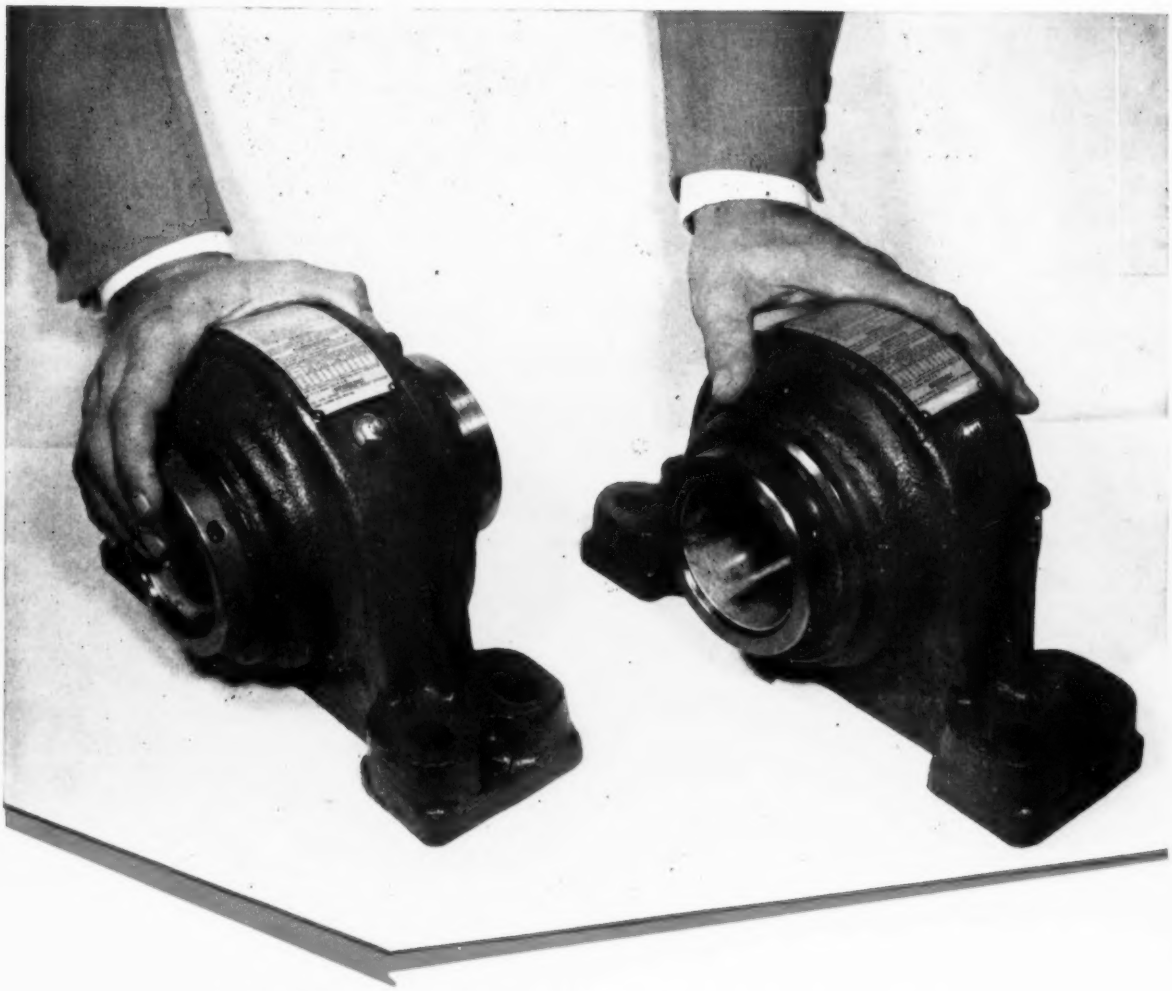
Business in Vacationland—The Southeast Machinery Co. has been formed in Florida by three men prominent in the machine tool industry. The new company will serve the growing market in Florida for machine tools.

President is George Habicht, Jr., chairman of the board of Marshall and Huschart Machinery Co., Chicago. Richard W. Banfield, president of Motch and Merryweather Machinery Co., Cleveland, and Thomas R. Rudel, president of Rudel Machinery Co., New York, are secretary and treasurer, respectively.

New Association—A nation-wide organization of firms, including Canadian, engaged in repair of machinery and metal parts have established a national trade association. Known as the American Metal Repair Assn., the trade group will be headquartered in the Investment Bldg., Pittsburgh. R. L. Rectenwald, Maintenance Engineering Corp., Pittsburgh, is president.

Batteries Charged—An Alkaline Battery Div. has been established by Gulton Industries, Inc. The division will produce and market nickel cadmium and nickel iron batteries and associated equipment. The company also has been licensed to produce and market alkaline batteries in the U. S., under patent rights held by SAFT-France. Gulton will take over the management and operation of the Lodi, N. J. plant, formerly operated by the SAFT Corp. of America.

For Austrian Steel—Austria has ordered over $8 million in electrical equipment from Westinghouse Electric International Co. It will power three new steel rolling mills at Alpine Montan, Vienna, part of a $56 million modernization and expansion program. A total of 46 main drive motors delivering 37,350 hp will be supplied by Westinghouse for a combination merchant bar-hot strip mill and a four-strand rod mill. Both will be located at Donawitz. An alloy bar mill will be installed at Judenburg.



There's a big difference in these pillow blocks . . . Bearings, Inc. knows the difference. Do you?

One of these pillow blocks contains a non-expansion or "fixed" bearing unit. The other is an expansion or "floating" bearing. Mix them up—order a "fixed" bearing where conditions dictate an expansion unit—and you are in trouble. Bearing failure in a very short time is almost certain.

One of our customers recently ordered spare bearings for new coal handling equipment and overlooked that important difference. They allowed us to check their survey of bearing requirements against the actual bearings installed on the equipment. We found on many applications "floating" units were required and their order failed to specify this vital point. Savings in time, trouble and money for our customer by this simple check were important.

Let us help *you* survey your bearing requirements—let us check the actual bearings in your equipment and we will be ready with the correct bearings you need when you need them. Call or write our branch nearest you now!

Providing bearing service in the north

BEARINGS, INC.

OHIO: Akron • Canton • Cincinnati • Cleveland • Columbus • Dayton • Elyria • Hamilton • Lima • Lockland • Mansfield • Toledo • Youngstown • Zanesville
INDIANA: Ft. Wayne • Indianapolis • Muncie • Terre Haute • **PENNSYLVANIA:** Erie • Johnstown • Philadelphia • Pittsburgh • York
WEST VIRGINIA: Charleston • Huntington • Parkersburg • Wheeling • **NEW JERSEY:** Camden
NEW YORK: Buffalo, Balanrol Corp. • **MARYLAND:** Baltimore • **DELAWARE:** Wilmington

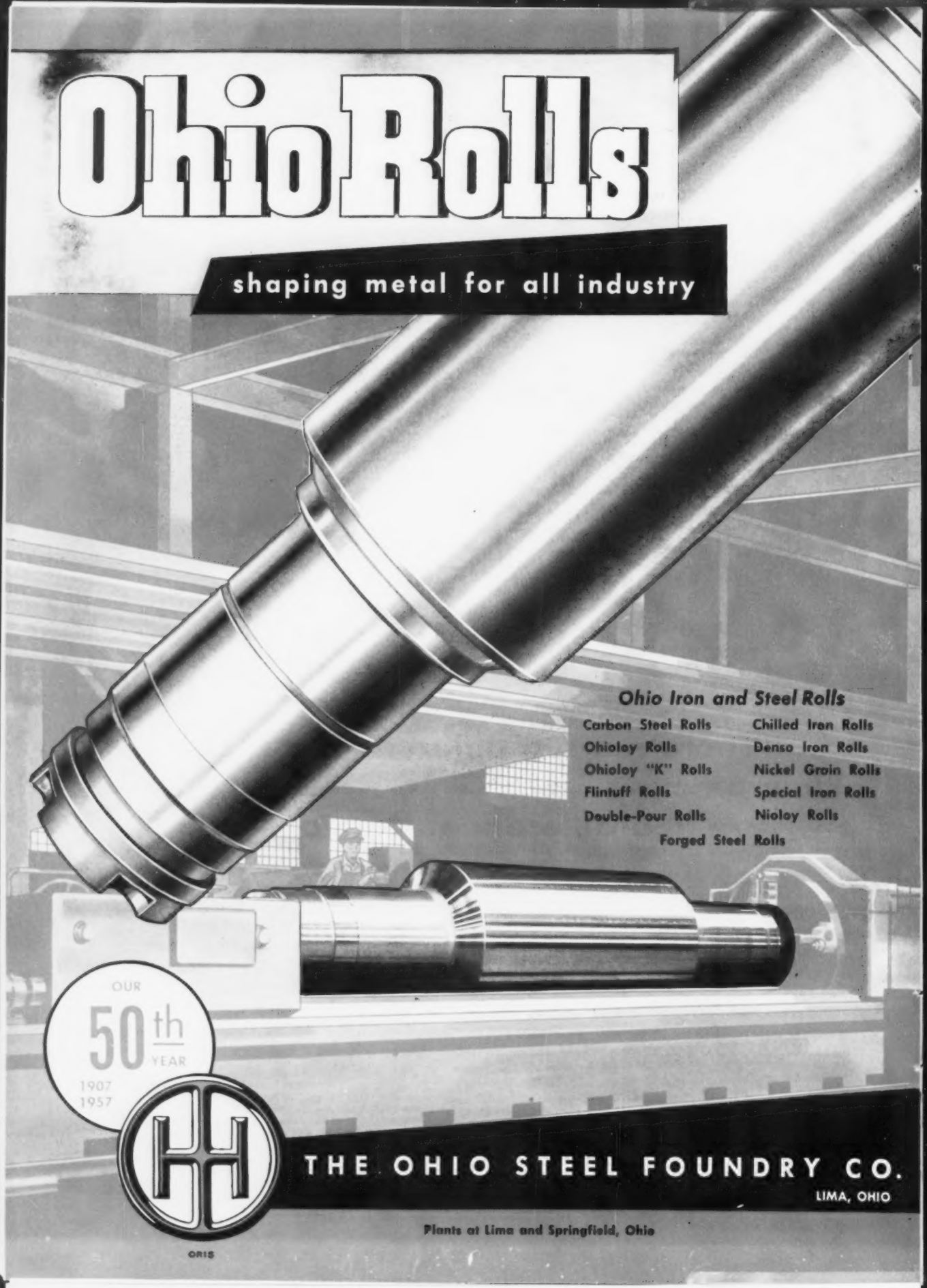
and in the south

DIXIE BEARINGS *INCORPORATED*

FLORIDA: Jacksonville • **GEORGIA:** Atlanta • **KENTUCKY:** Louisville • **LOUISIANA:** Baton Rouge • New Orleans
N. CAROLINA: Charlotte • Greensboro • **S. CAROLINA:** Greenville • **TENNESSEE:** Chattanooga • Kingsport • Knoxville • Nashville

Ohio Rolls

shaping metal for all industry



Ohio Iron and Steel Rolls

Carbon Steel Rolls	Chilled Iron Rolls
Ohioloy Rolls	Denso Iron Rolls
Ohioloy "K" Rolls	Nickel Grain Rolls
Flintuff Rolls	Special Iron Rolls
Double-Pour Rolls	Nioloy Rolls

Forged Steel Rolls

OUR 50th YEAR 1907 1957

THE OHIO STEEL FOUNDRY CO.

LIMA, OHIO

Plants at Lima and Springfield, Ohio

ORIS

pointed manager, shop operations,

P. F. Bauer, E. J. Mercer and **W. M. Wallace,** named vice presidents, Allis-Chalmers Mfg. Co.; **A. D. Dennis,** will become secretary.

J. B. Kendall, elected vice president, Delta Welder Corp., Detroit.

W. H. Oswald, elected vice president, Alvey Conveyor Mfg. Co., St. Louis.

T. A. Fribley, elected vice president, The Cleveland Cap Screw Co., Cleveland.

D. B. Benedict, elected vice president, Union Carbide Corp.; **E. E. Fogle,** appointed president, Union Carbide Chemicals Co.; **H. D. Kinsey,** appointed president, Union Carbide Olefins Co., a division of the corporation; **T. R. Ragland,** appointed executive vice president, Union Carbide International Co.

W. A. McCune, Jr., will become manager, field sales, Abrasive Div., Norton Co., Worcester, Mass.

H. F. Falk, elected president, The Falk Corp., Milwaukee.

R. W. Heiden, elected president and general manager, all plants and operations, Progressive Welder Sales Co., Pontiac, Mich.

L. C. Simmons, appointed asst. executive vice president, accounting, U. S. Steel Corp.; **R. M. Braund,** appointed vice president, accounting.

R. M. Morris and **H. I. Martin,** elected vice presidents, Swindell-Dressler Corp., Pittsburgh; **Owen Cross** and **Jerome Gordon,** have been appointed asst. vice presidents; **S. B. Casey, Jr.,** named asst. treasurer.

E. M. Velten, appointed technical director, The Beryllium Corp., Reading, Pa.

E. N. Hower, appointed vice president, Charles T. Brandt, Inc., Baltimore, Md.

W. C. Willits, appointed treasurer, Pennsalt Chemicals Corp., Philadelphia.

A. R. Fisher, named chief executive officer, Johns-Manville Corp.

F. H. Greene, Jr., elected vice president, National Research Corp.; **D. D. Nickerson,** elected treasurer.

H. R. Black, appointed general sales manager, U. S. Steel Homes Div., U. S. Steel Corp.

J. R. Fox, named asst. general manager, Refining Div., Aluminum Co. of America.

Robert Cushman, will become manager, marketing services, Abrasive Div., Norton Co., Worcester, Mass.

R. J. Zale, appointed general sales manager, Vulcan Crucible Steel Div., H. K. Porter Co., Inc., Aliquippa, Pa.

W. H. McCarty, Jr., appointed district manager, Latrobe Steel Co.'s sales and sales-engineering work, Boston headquarters.

M. F. Kent, appointed manager, apparatus product sales, General Electric Co.'s User Industries Sales Dept., New York; **T. D. West,** ap-

The PROOF of P&C STEEL is in its PERFORMANCE ON YOUR

Large or small INDUSTRIAL CUT GEARS

- FURNISHED COMPLETE
- CUSTOM CUT FROM YOUR BLANKS
- HEAT-TREATED, CASE OR FLAME-HARDENED

SIMONDS GEAR produces a complete line of industrial cut gears in a full range of sizes from cast or forged steel, gray iron, bronze, Meehanite, rawhide or bakelite. Also heat-treated, case or flame-hardened carbon or alloy steel. Or, you may have your own gear blanks custom cut to your order. Same quality . . . same prompt service. Send us your requirements for quotation.

ALSO stock carrying distributors of Ramsey Silent Chain Drives and Couplings; and industrial V-belts.

SPUR GEARS • BEVEL GEARS • MITRE GEARS
WORMS • WORM GEARS
RACKS
PINIONS

SIMONDS GEARS

THE SIMONDS GEAR & MFG. CO.
LIBERTY at 25TH PITTSBURGH 22, PA.

Quality Gears for over 65 years

pointed manager, shop operations, Everett steel foundry of GE's Foundry Dept., Schenectady, N. Y.

E. D. Pieri, named manager, sales engineering, Stran-Steel Corp., Detroit; **R. V. Longcor,** named manager, architectural products sales.

J. M. Embree, named new applications manager and asst. to the president, Mid-Century Instrumatic Corp., New York.

J. H. Lund, appointed sales manager, Upset Forgings Div., The Champion Rivet Co.; **D. J. Champion,** promoted to general sales manager.

J. R. Stein, appointed general manager, Louisiana Div. facilities, The Dow Chemical Co.

V. J. Eberl, appointed plant superintendent, Robertshaw Thermostat Div., Youngwood, Pa., Robertshaw-Fulton Controls Co.

F. R. Anderson, named asst. manager, Denver Div., Gardner-Denver Co.; **R. F. Schaffer,** appointed chief metallurgist, Denver Div.

J. D. Sherman, appointed Eastern sales manager, Reed-Prentice Corp., Worcester, Mass.

R. J. Rooke, promoted to general superintendent, Stamping Div., Eaton Mfg. Co., Cleveland; **G. T. Schneider,** named production control manager.

R. H. Thompson, appointed manager, foundry sales, Climax Molybdenum Co.

B. L. Phillips, appointed production control manager, Des Moines, Iowa, Implement Plant, Ford Motor Co.

Peter Zack, appointed asst. manager, Maspeth, N. Y., plant, National Can Corp.

C. F. Lloyd, Jr., appointed asst. general sales manager, Fort Duquesne Steel Co., Pittsburgh.

R. W. Fish, appointed sales and service engineer, Roll Div., The United Engineering & Foundry Co., Pittsburgh.

T. H. Locke, Jr., named manager, Steel Mill Div., Phoenix Mfg. Co., Joliet, Ill.

P. J. Berg, named sales manager, Engineering and Construc-

The PROOF of DSC STEEL is in its PERFORMANCE ON YOUR JOB

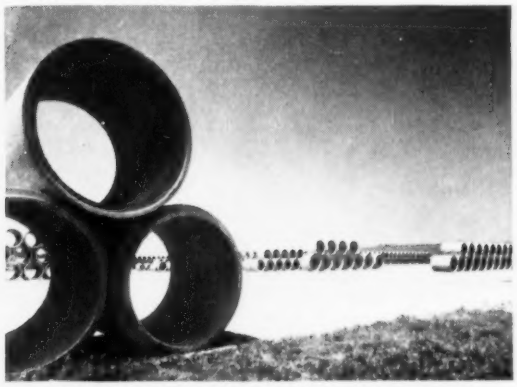
DSC Electro-Welded Wire Fabric Makes Concrete Crack-Resistant

DSC PHOTO

A section of the new Detroit-Toledo Expressway. Contractor: Denton Construction Company.

DSC PHOTO

Pouring concrete slab, DSC Portsmouth Fabric reinforced.



COURTESY U. S. CONCRETE PIPE COMPANY, CLEVELAND, OHIO

View of concrete pipe storage field.

. . . a life preserver and a money-saver for concrete in pavements, structures, drainage systems, precast products . . .

WHAT IT DOES — DSC Portsmouth Fabric is a quick, easy, economical means of multiplying the practical uses of concrete. It reinforces the concrete by supplying the tensile strength which the aggregate commonly lacks. It bonds with the concrete to make it crack-resistant under stresses and strains.

WHAT IT IS — DSC Portsmouth Fabric is woven of Bright Basic L.C. Reinforcing Wire. The wire intersections are electrically welded and so produce a continuous lattice-work mesh available in rolls or mats (up to 156" wide). **The fabric conforms to ASTM Specification A-185-56T to meet all Job-Performance requirements.**

ITS PUBLIC BENEFITS — In concrete pavements DSC Fabric promotes safer, faster highway driving; in public structures, sewerage and general drainage projects it reduces upkeep costs, saves tax money; in dwellings it prolongs useful life, protects against leaks and vermin.

For prompt information about the profitable uses of DSC Fabric, other DSC Rod and Wire products, DSC Sheet and Strip Steel—please write DSC General Sales Office or call your nearest DSC Customer "Rep". . . today!

Customer Satisfaction Is Our Business

DETROIT STEEL CORPORATION

GENERAL SALES OFFICE, DETROIT 9, MICHIGAN

DSC CUSTOMER "REPS" IN PRINCIPAL CITIES

DSC MILLS AND PRODUCTS

PORTSMOUTH DIVISION, PORTSMOUTH, O.

Coke • Coal Chemicals • Pig Iron
Basic OH Steel Ingots • Blooms • Slabs • Billets • Rods
Hot Rolled and Cold Rolled Sheets • Low and Medium Carbon Manufacturers Wire • High Carbon Specialty Wire • Aluminum Cable Steel Reinforcement • Rope Wire • Tire Bead Wire • Welded Wire Fabric

MILL DIVISION: DETROIT, MICH., HAMDEN, CONN.

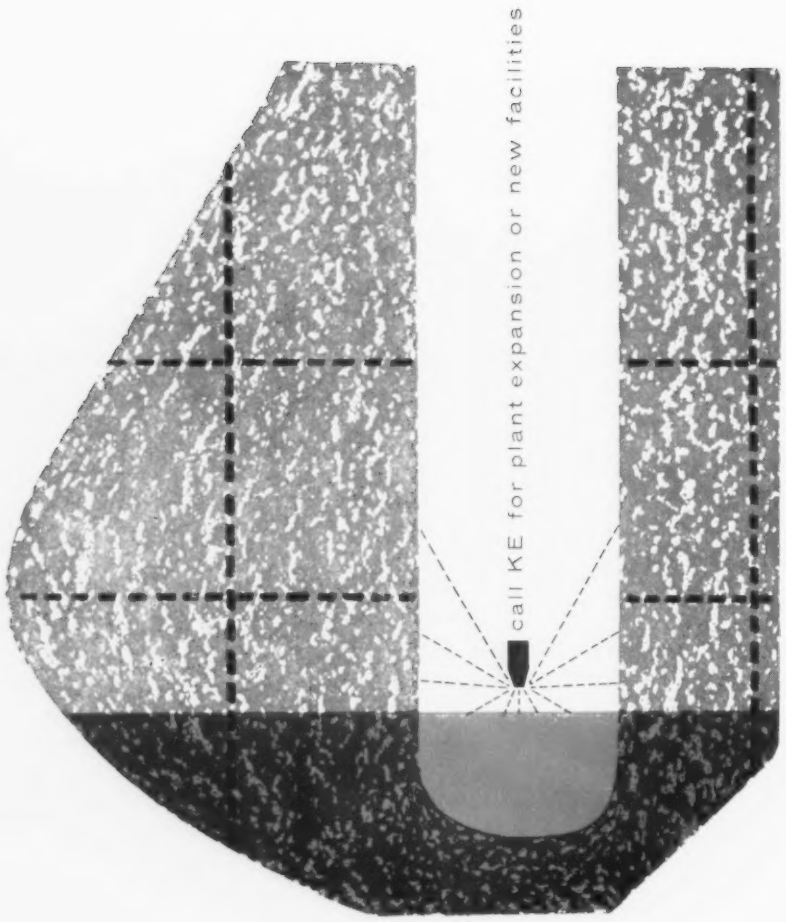
Cold Rolled Carbon Steel Strip
Flat Cold Rolled Carbon Spring Steel

COPYRIGHT 1957

tion Dept., Machinery Div., Dravo Corp., Pittsburgh.

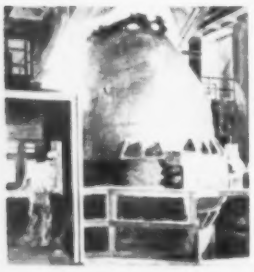
J. K. Lightfoot, appointed chief engineer, Missile Products Div.,

C. R. Day, promoted to plant engineer, A. M. Byers Co. plant in



INGENUITY

has made KE the experienced leader in L-D Process Steel



L-D process plant similar to that now being installed by KE at a major eastern steel plant.

Design and construction of over 2,000,000 tons of oxygen steel making capacity. Intimate familiarity with oxygen steel technology in all parts of the world. A pioneer's experience in applying tested techniques of steel making. U.S. licensor for the proven L-D process—also P.T. Oxygen Guns for present and planned open hearths.

These are reasons why Kaiser Engineers is uniquely qualified to develop your oxygen steel program. Another reason is traditional KE ingenuity—engineering and construction ingenuity which means your steel facilities will be completed more quickly, at lower cost, and operate more efficiently.

Economic analysis, plant location, engineering, design, procurement, expediting, construction—KE does one or all. With your first thought of new steel producing facilities—call KE.

KAISER ENGINEERS engineers—contractors

Contracting since 1914

Division of Henry J. Kaiser Company • Oakland 12, California • New York, Pittsburgh, Washington, D.C., Buenos Aires, Calcutta, Dusseldorf, Montreal, Sydney, Tokyo

tion Dept., Machinery Div., Dravo Corp., Pittsburgh.

T. A. McLay, appointed assistant to the president, Bethlehem Steel Co.

S. W. Nelson, named sales representative, Cincinnati district office, Clark Controller Co., Cleveland.

D. B. Swarr, appointed abrasive engineer, Bay State Abrasive Products Co.

J. K. Lightfoot, appointed chief engineer, Missile Products Div., Beckman & Whitley, Inc., San Carlos, Calif.

J. E. Decker, promoted to chief metallurgist, Green River Steel Corp. in Owensboro, Ky., subsidiary of Jessop Steel Co., Washington, Pa.

A. J. Slater, appointed assistant to the president, Bethlehem Steel Co.

C. R. Day, promoted to plant engineer, A. M. Byers Co. plant in Ambridge, Pa.

H. H. Weikel, appointed assistant to the president, Bethlehem Steel Co.

W. A. St. Clair, named asst. sales manager, Industrial Truck Div., Hyster Co.; **J. N. Rector,** named asst. sales manager, Industrial Truck Div.; **Paul Fischer,**

TAPE-MASTER *PROTECTIVE TAPE APPLICATOR*

Get perfect taping jobs on metal sheets in just a fraction of the time required by hand labor.

Operated manually, Tape-Master applies protective tape to metal smoothly and evenly, without bubbles or wrinkles. Handles sheets up to 90 inches wide and 20 feet long.

- ★ Different kinds or widths of tape and paper can be applied simultaneously
- ★ Spot or intermittent taping is easy with Tape-Master.
- ★ Butt and lap joints, if desired, all in one operation.
- ★ Built-in cut off knife makes accurate, clean cuts anywhere on sheet.
- ★ Sheets held in tension during application.
- ★ Carpeted table prevents scratches.
- ★ Casters and self-leveling floor locks permit Tape-Master to be moved easily.
- ★ Dual axis supply rolls.
- ★ Web tension control.

MODELS AVAILABLE TO SUIT YOUR REQUIREMENTS

CAN BE OPERATED BY UNSKILLED LABOR

A two man crew of unskilled help can keep your production lines humming while giving you consistent wrinkle-free tape application.

SEND FOR FREE ILLUSTRATED BROCHURE

"Tape-Master in Action"—16 mm. colored movie available on request.

TAPE-MASTER A DIVISION OF **Sod-Master Corporation** 1023 N.E. Marshall St. • Minneapolis 13, Minn.

named manager, Portland manufacturing plant; **Fay Brainard,** appointed chief methods engineer.

T. E. Berry, named assistant general sales manager in charge of field sales personnel training and development, DeWalt Inc., Lancaster, Pa.; **C. B. Hull, III,** named assistant general sales manager—internal sales operations; **M. R. Boyer,** named sales promotion manager.

C. F. Rental, named technical service supervisor, The Stanley Chemical Co., E. Berlin, Conn.; subsidiary of The Stanley Works.

E. P. Meredith, named exclusive representative, metropolitan New York, Minster Machine Co., Minster, O.

W. J. Hannon, appointed Chicago District sales manager, Leschen Wire Rope Div., H. K. Porter Co., Inc.

IT'S THE *MOST

ANNOUNCING
the Sensational NEW
miller
GOLD STAR
SR

It DELIVERS maximum arc stability for:
a. Sounder, denser welds – and more of them – in less time, with . . .
b. ALL electrodes, in . . .
c. Any and all positions

How is this performance possible? THE MILLER GOLD STAR SR introduces a . . .
NEW transformer
plus
NEW weld stabilized current
plus
NEW completely sealed semi-metallic rectifier

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Tested across the country by practical, critical, hard-bitten working weldors, here's what they say about the new Miller GOLD STAR SR:
"it's the DC performance I've always wanted"
"here's DC welding current that's . . . perfect!"
"positively handles ALL electrodes better"
"best deal I've seen for v and o work"
"easiest arc starting in my experience"
"smoothest arc I ever used . . . and . . . quiet!"
* "it's just plain the MOST"
Complete particulars on the MILLER GOLD STAR SR, including inert gas and automatic fixture welding, is now available on request.

". . . if it's Miller you know it's the finest . . ."

miller Electric Manufacturing Company, Inc.
APPLETON, WISCONSIN
distributed in Canada by CANADIAN LIQUID AIR CO., LTD., Montreal

G. H. Blackburn, appointed foundry manager, W-K-M, Div. of ACF Industries, Inc.

M. D. Scott, appointed materials engineer, Sales Dept., The Beryllium Corp., Reading, Pa.

P. D. Deeley and **G. E. Smith,** appointed sales engineers, Electro Metallurgical Co.

D. W. Branning, appointed manager, American Broach and Machine Div., Ann Arbor, Mich., Sundstrand Machine Tool Co., Rockford, Ill.

A. R. Baldwin, appointed specialist, wire products and sheets, sales staff, Republic Steel Corp.

D. C. McCarthy, Jr., named director, manufacturing planning, Chrysler Corp., Detroit.

R. L. Hodapp, named field engineer, Detroit district, General Plate Div., Metals & Controls Corp., Attleboro, Mass. **E. R. Howard** joins

Truflex Thermostat Metal sales and engineering staff, General Plate Div.

E. P. Pool, promoted to chief research engineer, Edward Vales, Inc., E. Chicago, Ind.; **W. G. Hegener,** appointed research and engineering coordinator, and **H. N. Myers,** named research metallurgist.

W. A. Shoenberger, promoted to asst. superintendent, Finishing Dept., Campbell Works, Youngstown District, The Youngstown Sheet and Tube Co.

S. F. Davies, named director, General Products Divisions, Westinghouse Electric Corp.; **L. H. Loufek,** named marketing director, apparatus products; and **R. M. Wilson,** named marketing director, Defense Divisions.

A. F. Uhrlandt, appointed director, field sales, Crouse-Hinds Co., Syracuse, N. Y.

E. W. Engle, appointed production control manager, Dodge Div., Chrysler Corp., Detroit.

V. L. Bradford, will become, president, Milford Rivet & Machine Co., Milford, Conn.

OBITUARIES

Leroy Salsich, 78, former president, Oliver Mining Div., U. S. Steel Corp.

E. O. Landstrom, 58, secretary, Sundstrand Machine Tool Co., Rockford, Ill.

Specify *Michigan* Tubing for economy and versatility

A Quality Product

ROUND

¼" to 4" O.D. 7 to 22 gauge

SQUARE	Gauge	RECTANGULAR
⅜" to ¾"	16 thru 22	⅜" minimum side to 5" maximum side
¾" to 1"	11 thru 22	
1" to 2"	11 thru 20	
2" to 3"	11 thru 18	

Carbon 1010 to 1025

Standard Sizes

Tube Diameter O.D. Size	Maximum Wall Decimal	BWG Gauge	Minimum Wall Decimal	BWG Gauge
¼	.065	16	.022	24
½	.083	14	.022	24
⅝	.095	13	.022	24
¾	.095	13	.022	24
⅞	.095	13	.028	22
1	.095	13	.028	22
1⅛	.095	13	.028	22
1¼	.095	13	.028	22
1⅜	.095	13	.035	20
1½	.120	11	.035	20
1⅝	.120	11	.035	20
1¾	.120	11	.035	20
1⅞	.180	7	.035	20
2	.180	7	.035	20
2⅛	.180	7	.035	20
2¼	.180	7	.035	20
2⅜	.180	7	.035	20
2½	.180	7	.035	20
2⅝	.180	7	.035	20
2¾	.180	7	.035	19
2⅞	.180	7	.042	19
3	.180	7	.042	19
3⅛	.180	7	.042	19
3¼	.180	7	.042	18
3⅜	.180	7	.049	18
3½	.180	7	.049	18
3⅝	.180	7	.049	18
3¾	.180	7	.049	18
3⅞	.180	7		
4				

For 40 years

Michigan has been manufacturing tubular parts for leading manufacturers. This acceptance of Michigan tubing has been won by meticulous attention to customer requirements and the supplying of the very best in tubing. The following advantages of low cost manufacture and utmost dependability are yours when you specify Michigan for tubular parts in the fabrication of your products:

1. It is fabricated in round, square and rectangular shapes, in a wide range of sizes;
2. It is always of uniform strength, weight, ductility and weldability;
3. It can be flanged, expanded, tapered, swaged, beaded, upset, flattened, forged, spun closed, fluted and rolled.
4. Complete facilities for the COLD DRAWING, ANNEALING and TESTING of tubing we manufacture.

RESISTANCE WELDED STEEL TUBING

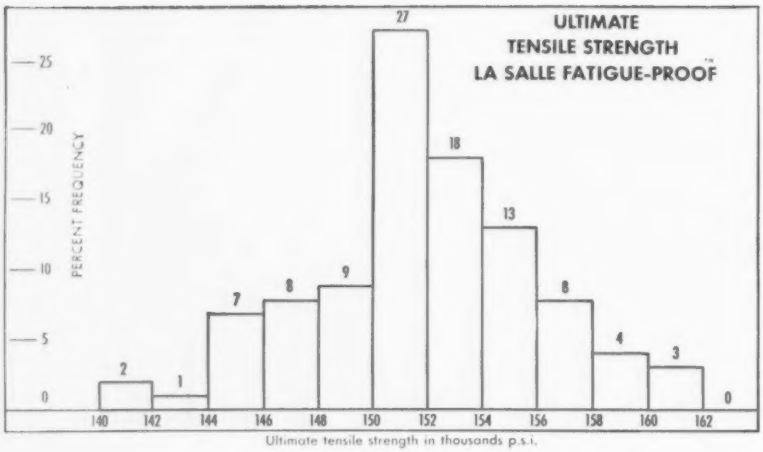
Michigan STEEL TUBE PRODUCTS CO.

THE OLDEST NAME IN ELECTRIC

Consult Michigan
for engineering and technical help in the selection of tubing best suited to your needs.

40 Years in the Business
9450 BUFFALO • DETROIT 12, MICH.
FACTORIES: Detroit, Michigan • Shelby, Ohio

DISTRIBUTORS: Steel Sales Corp., Chicago, St. Louis, Milwaukee, Indianapolis and Minneapolis—Miller Steel Co., Inc., Hillside, N. J.—Service Steel Div., Van Pelt Corp., Los Angeles, Calif.—Donald A. Harston, Cleveland, Ohio—Globe Supply Co., Denver, Colo.—W. A. McMichaels Co., Upper Darby, Pa.—William P. Hall & Associates, Dayton, Ohio—John Emery West, Miami, Florida—Gary A. Osborne, Buffalo, N. Y.—Earle M. Jorgensen Co., Houston, Texas



The above chart shows the range of ultimate tensile strength over a period of one year's production. Average value obtained is approximately 150,000 p.s.i.

"e.t.d."™ Process Applied to FATIGUE-PROOF™ Steel Bars Gives Added Strength, Greater Uniformity, Better Machinability

Guaranteed 140,000 p.s.i. minimum tensile . . . no heat treating necessary

Six important physical and mechanical properties, (1) a high strength level, (2) exceptional uniformity, (3) improved machinability, (4) wear resistance, (5) resistance to fatigue, and (6) dimensional stability, are desirable features of La Salle "FATIGUE-PROOF" steel bars, produced by the new "e.t.d." (Elevated Temperature Drawing) process.

Strength . . . "FATIGUE-PROOF" is a carbon steel bar which replaces both hot-rolled or cold-finished carbon and alloy heat-treatable steel bars. Production figures show hardnesses between Rc 30 and Rc 36 (with a minimum hardness guarantee of Rc 30). The guaranteed minimum tensile strength is 140,000 p.s.i. with a 150,000 p.s.i. average.

"FATIGUE-PROOF" is better than a heat treated bar because it is not quenched and tempered and so the problems frequently associated with quenching and tempering such as (1) quench cracks, (2) non-uniformity of section, (3) soft centers, and (4) heat treat distortion are eliminated. Costly secondary operations such as grinding, cleaning, and straightening are not necessary. Rejects are minimized.

Exceptional uniformity... "FATIGUE-PROOF" is remarkably uniform from bar to bar, end to end, size to size, and lot to lot. Design and production engineers can depend upon it being the same from day to day and job to job.

Individual processing of each bar plus the inherent good qualities and characteristics of the "e.t.d." process account for the excellent uniformity. Microstructures are uniformly pearlitic.

Improved machinability... "FATIGUE-PROOF", made by "e.t.d.", machines 50% to 100% faster than heat treated alloys, and 25% faster than annealed alloy steels. It machines with a very fine finish, and gives excellent tool life. These characteristics make it an ideal steel for production parts.

Wearability . . . Field applications such as gears, pinions, pins, and screws prove that "FATIGUE-PROOF" has good wear resistance. It resists galling and seizure, partly due to its hardness . . . and probably due to the anti-weld characteristics of its chemistry. Further, "FATIGUE-PROOF's" pearlitic structure appears to resist sliding wear better than a quenched and tempered structure of equal hardness.

Resistance to fatigue . . . The chief reason for the failure of highly stressed parts is fatigue. While part shape, unfavorable residual stresses, tool marks, gouges in highly stressed areas, and many other factors contribute to fatigue failure, most materials have also an inherent quality . . . endurance limit that is an indication of ability to resist fatigue.

"FATIGUE-PROOF" has this inherent quality to resist fatigue. Laboratory tests prove that fatigue properties are at least comparable to those of expensive heat treated steels of the same strength level. Numerous field tests, under severe operating conditions, have proved this to the satisfaction of many manufacturers.

Dimensional stability... "FATIGUE-PROOF" maintains a high degree of dimensional stability in machining because of its low order of residual stresses.

Details of the "e.t.d." process . . . Elevated Temperature Drawing involves (1) the selection of bar chemistry, (2) the amount of reduction in cross-sectional area of the bar as it is drawn through a special die, and (3) a preselected elevated drawing temperature which will result in the desired final properties.

Although the "e.t.d." process was first announced early in 1957, it has been used in the production of "FATIGUE-PROOF" steel bars since September 1955. Four U.S. Patents (Nos. 2,767,835, -6, -7, and -8) were granted October 23, 1956, covering the "e.t.d." process — an exclusive development of La Salle Steel Company.

How manufacturers can obtain sample Fatigue-Proof steel bars for testing

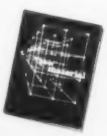
LaSalle Steel Company has announced that samples of "FATIGUE-PROOF" steel bars, made by the "e.t.d." (Elevated Temperature Drawing) process, are available for test purposes on a no charge basis to manufacturers where it appears that "FATIGUE-PROOF" can help improve products and reduce production costs.

Applications for a sample bar are invited from manufacturers making parts from either hot-rolled or cold-finished carbon or alloy steel bars which require high tensile strength.

Interested manufacturers may write for a test sample by sending a blueprint or application details direct to LaSalle Steel Company, Advertising Department, P. O. Box 6800-A, Chicago 80, Ill.

"FATIGUE-PROOF" is also available from your steel distributor . . . write for his name.

Brochure tells story of Fatigue-Proof steel bars



"A New Material" is the title of a 24-page booklet which gives detailed information covering La Salle "FATIGUE-PROOF" steel bars made by the Elevated Temperature Drawing process.

The booklet presents the results of more than one year's tests of production samples and reports on eight application case studies. Copies available on request.

TM—Trademarks of La Salle Steel Company

La Salle STEEL CO.

1436 150th STREET
HAMMOND, INDIANA

lodge & shipley model X lathe paid for itself in just 18 months!

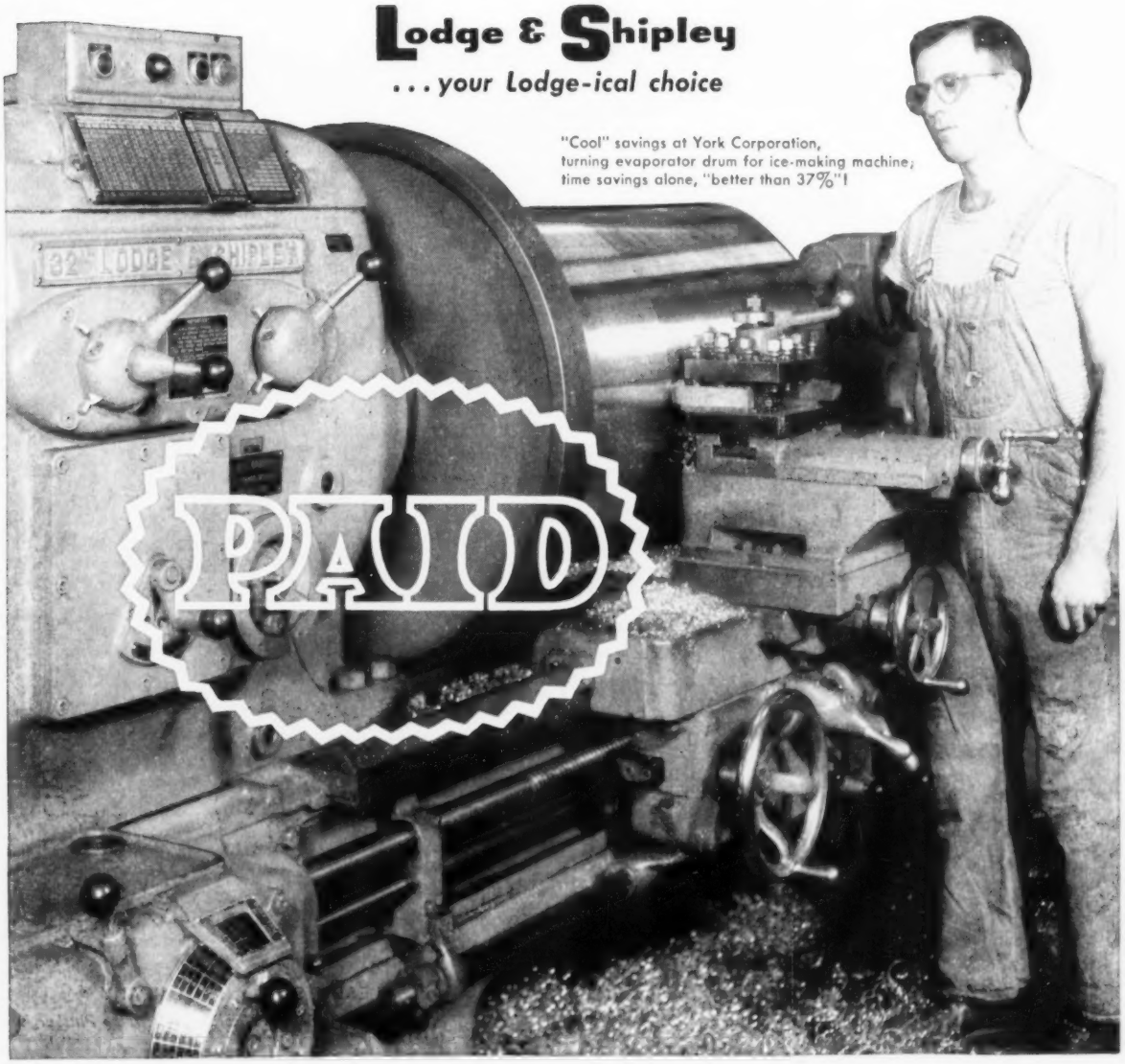
Time savings on a single workpiece, an evaporator drum 24" in diameter and 35" long, have paid for a Model X Lathe in just 18 months. The user, York Corporation, Division of Borg-Warner, records per piece savings at $25.92, saving 172.8 minutes against a previous time of 465.5 minutes per piece. Annual savings figure to $12,400!

Conservatively priced yet ruggedly durable, Lodge & Shipley Model X Lathes are an outstanding value with speed, power and accuracy equal to lathes costing far more.

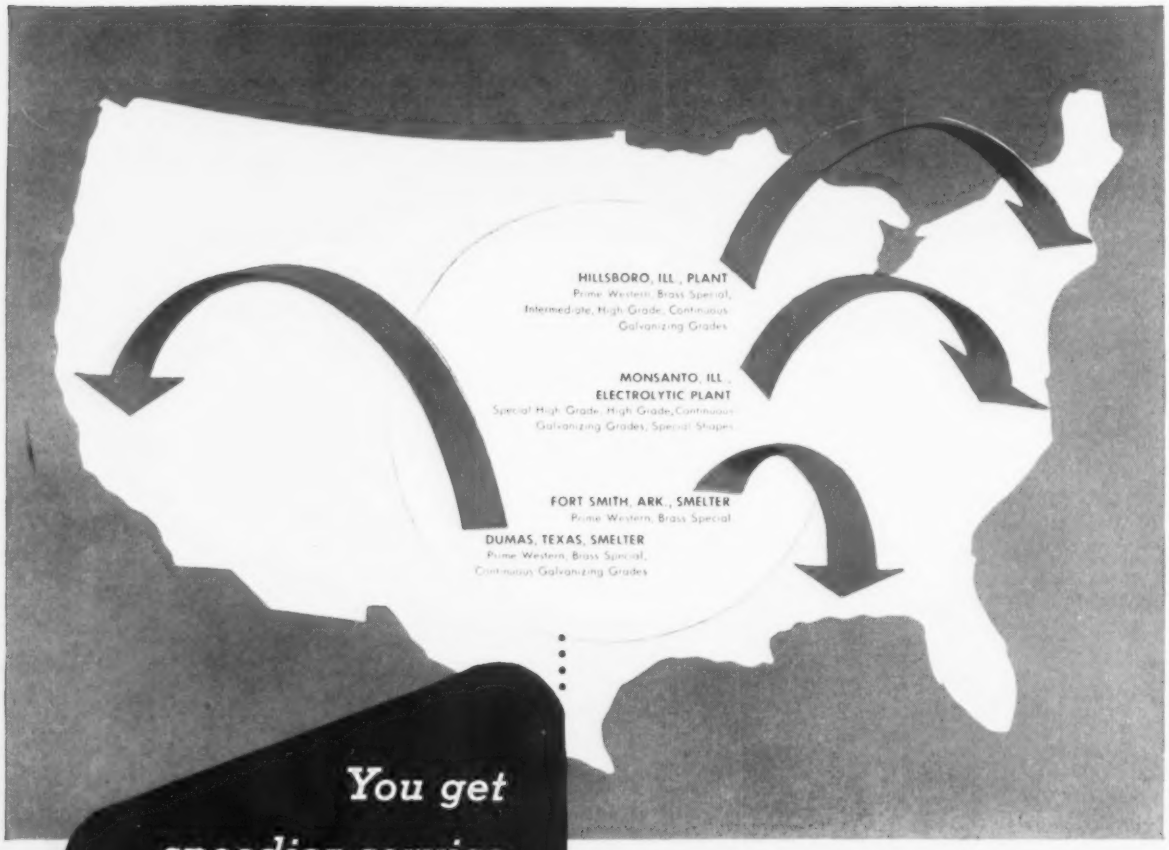
If you would like a complete case history report on the Model X performance outlined above, write today: **The Lodge & Shipley Co., 3073 Colerain Ave., Cincinnati 25, Ohio.**

Lodge & Shipley

. . . your Lodge-ical choice



"Cool" savings at York Corporation, turning evaporator drum for ice-making machine; time savings alone, "better than 37%"!


HILLSBORO, ILL., PLANT
Prime Western, Brass Special, Intermediate, High Grade, Continuous Galvanizing Grades
MONSANTO, ILL., ELECTROLYTIC PLANT
Special High Grade, High Grade, Continuous Galvanizing Grades, Special Shapes
FORT SMITH, ARK., SMELTER
Prime Western, Brass Special
DUMAS, TEXAS, SMELTER
Prime Western, Brass Special, Continuous Galvanizing Grades

You get speedier service from the ZINC ZONE

Central location of American Zinc plants assures prompt deliveries of slab zinc to any point in the nation.

PRODUCERS OF

ALL GRADES OF SLAB ZINC
ZINC ANODES (Plating & Galvanic)
METALLIC CADMIUM
SULPHURIC ACID
LEAD FREE and LEADED ZINC OXIDES
ZINC CARBONATE
GERMANIUM DIOXIDE
AGRICULTURAL LIMESTONE
CRUSHED STONE

American Zinc sales Company

Distributors for AMERICAN ZINC, LEAD & SMELTING COMPANY
Columbus, Ohio • Chicago • St. Louis • New York • Detroit • Pittsburgh

FEATURE ARTICLES

A New Way To Select Wear-Resistant Materials

By J. R. Drear—Met. Lab. Supervisor, Eaton Mfg. Co., Detroit

A lot of guessing can go into the choice of wear-resistant materials for a particular job. And wrong guesses are costly.

You can guide yourself to the right choice by classifying wear conditions, then checking to see what others do in these areas.

Here's a rundown on the various wear classifications, with suggested material recommendations.

■ How do you decide which metal or metals will give you maximum wear resistance in a particular application? You can reach a decision by costly trial-and-error methods, of course.

But you'll probably be time and money ahead if you classify the wear application first and then see what wear-resistant metals other firms have used in similar cases.

Assuming clean lubricant and normal (below 300°F) operating temperatures, wear applications can be classified according to stress and lubrication conditions as follows:

1. Low unit stress where the lubricant film remains intact.
2. High unit stress where the lubricant film remains intact.
3. Low unit stress where the lubricant film is disrupted during operation.
4. High unit stress where the lubricant film is disrupted during operation.
5. Low unit stress where the lubricant film is either absent or, at most, only sporadic.

Two Basic Qualities—Metal or alloy combinations which work satisfactorily in each of the aforementioned wear conditions are selected with two qualities in mind: First, whether the materials can carry the loads imposed on them; second, whether the materials need have "self-lubricating" properties.

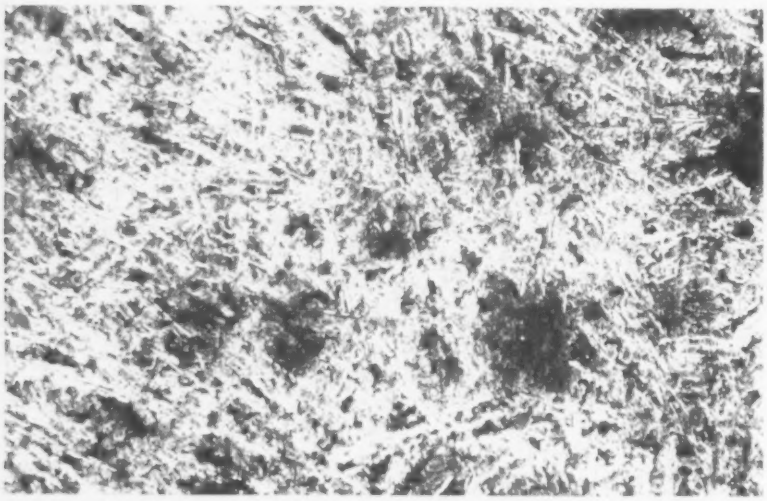
The condition of low unit stress with an intact film of lubricant (Class 1) is typified in the crankshaft journal and main bearings of a passenger car engine. The metals used need not have self-lubricating properties. However, those chosen should not readily weld together because a metal-to-metal condition may exist when the journal starts from rest.

Moreover, the metals selected must be strong enough to withstand

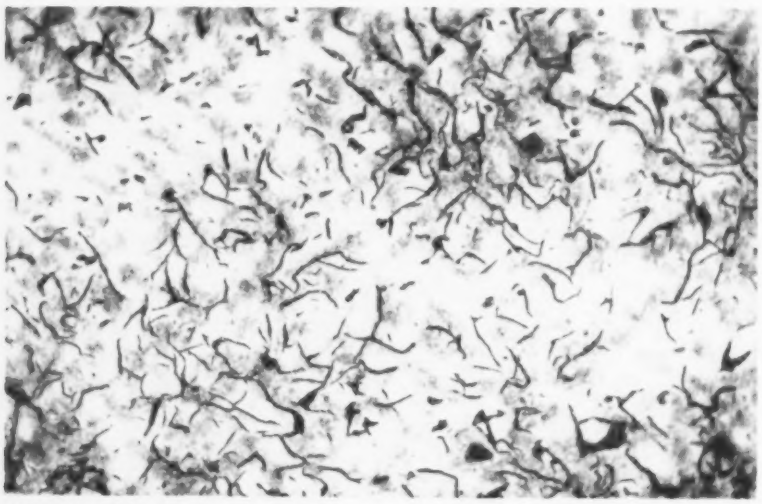
WRONG CHOICE: Microstructure of cast iron which caused pump parts to gall because of too much "blocky" ferrite (white areas).

THIS WAS BETTER: When gray iron pump parts were heat treated to eliminate free ferrite, troublesome galling stopped.

ANOTHER CHOICE: Although this ferrite-free, heat treated cast iron has ASTM type "D" graphite, it also works well in some pumps.



FOR HIGH STRESS: Unetched specimen from cast iron tappet (top) shows graphite which provides "self-lubrication." Required hardness comes from white carbide areas in etched specimen (bottom).



WORKS WELL: Microstructure of cast iron cam lobe which contacts tappet shows absence of free ferrite. Light areas are martensite.

deformation under the load transmitted through the oil film. Surface finish does not affect performance as long as none of the irregular peaks penetrate the oil film.

High Stress Setup—Ball bearing and race assemblies typify the wear condition of high unit stress where the lubrication film remains intact (Class 2). The mating metals need not have self-lubricating properties, but they must be strong enough to carry the high unit loads without deforming permanently.

In addition, the cyclic nature of these high unit stresses calls for materials with good fatigue resistance.

Surface finish is important for two reasons in any high-stress-intact-film application. First, a coarse finish forms stress-concentration notches which lower fatigue resistance. Second, high-contact loading thins out the oil film separating the ball and race to the point where surface irregularities might puncture it and produce metal-to-metal contact.

If such contact occurs, failure will result because neither of the metals are self-lubricating.

Some Dry Runs—In many low-unit-stress applications (Class 3) the lubricating film does not stay intact; mating surfaces run wet and dry alternately. This condition, termed "boundary" lubrication, occurs between the piston rings and cylinder wall in automotive engines. It also shows up between moving parts of some high speed hydraulic pumps which either handle aerated fluids or are subject to cavitation.

Cast iron works well in such applications; the graphite serves as a lubricant (or at least as a non-welding film) during dry periods of the lubrication cycle. The relative importance of graphite distribution varies with the severity of the application.

Of equal importance (and perhaps most overlooked) is the amount of free or "blocky" ferrite in the cast iron microstructure. This constituent tends to nullify the beneficial graphite effect by promoting galling or seizing of parts during dry periods in the lubrication cycle.

Type "A" Good—In as-cast cast irons, ASTM type "A" graphite is most often associated with freedom from blocky ferrite, and irons with this type of graphite do work well in boundary lubrication conditions.

However, cast irons with other types of graphite, such as ASTM type "D," can be heat treated to eliminate blocky ferrite. Thus treated, they will work satisfactorily in many, but not all, boundary lubrication applications. Heat treatment produces essentially no changes in graphite particle size or distribution.

Surface finish of mating parts is important where there are low unit stresses and a disrupted lubricant film. Irregularities on both surfaces should be low enough to allow parts to move past one another with minimum interference. This also reduces the area to be covered by the non-welding graphite film.

Not Too Smooth—But if surfaces are too smooth, it may be difficult to maintain a lubricant film for even part of the cycle. Such smoothness encourages a tendency for the mating surfaces to weld together.

In practice the ideal surface is often produced by hardening the metal (usually steel) which runs against cast iron having a rougher-than-optimum finish. As the cast iron becomes worn by the steel it develops a long-wearing, desirable glaze.

One of the most critical wear applications involves high unit stress where the lubrication film is disrupted (Class 4). The oil film in the contact area tends to be wiped away, resulting essentially in metal-to-metal contact. Camshaft lobes and the tappet faces which run against them are typical of this condition.

Watch Fatigue Factor—In such cases, materials used for mating parts must carry high unit stresses without permanently deforming. And because loading is repetitive, the metals must also be fatigue resistant.

Inasmuch as the parts are not continuously separated by a lubricant film, one of them should have self-lubricating properties. Break-in coatings such as phosphate or oxide films can help here. They aid oil film retention and lessen or even eliminate the dry period of the lubrication cycle in some cases.

Since parts run in intimate contact during the dry part of the cycle, surface finish is important. The height of surface irregularities on both parts must be kept to a minimum to prevent welding under high unit loads.

WEAR PLUS FATIGUE: Camshaft lobes are subject to interrupted lubrication. They must resist high unit stresses and metal fatigue.

Finish Can Vary—In practice, tappet faces are finished to about 6 microinches and cam lobes to about 10 microinches. However, some cam lobes with about a 20 microinch finish work satisfactorily in less severe applications.

Tappets are generally made of either chilled or hardenable cast iron while the camshaft is either cast iron or case hardened steel. The trend is toward the use of harder materials for both parts, although one of them should have self-lubricating properties. The use of cast iron with available free graphite takes care of this.

Application No. 5 on the classification list involves low unit stress where lubrication is either absent, or at best, only sporadic.

Random Splashing—A good example of this condition occurs in the interaction of the valve stem and valve guide in an internal combustion engine. The only lubrication comes in the form of an oil fog or splash from other parts of the engine.

This scanty supply of lubricant is deliberately arranged to cut down oil consumption. Because the oil splashes occur at random, unit stresses must be kept low for satisfactory operation.

To reduce the wear rate in this situation, the valve stem is either hardened by heat treatment or hard faced with a wear-resistant alloy.

Change The Surfaces—Where lubrication is so poor, it doesn't help much to use a self-lubricating material in either of the parts. Scuffing and sticking is prevented most effectively by altering the surfaces of the parts to aid retention of the little lubricant that does reach the wear area.

Most often the ID of the valve guide is "characterized" by rough reaming the surface to a 100-200 microinch finish, or by putting deep spiral grooves into the regular finish. The OD of the valve stem is made rougher by simply relaxing

Classify the wear problem before choosing materials

finishing specifications. For example, the 10-20 microinch finish usually specified can be switched to the 30-60 microinch range.

As in applications involving boundary lubrication, parts that are lubricated sporadically can benefit from the use of lubricant retaining phosphate or oxide coatings during the break-in period.

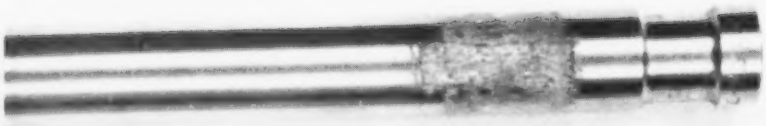
Apply A Coating—To eliminate valve stem scuffing in one instance, the first step was to roughen the mating surfaces slightly on both stem and guide. Then a phosphate coating was applied to the ID of the guide to aid lubricant retention still more.

The foregoing examples of wear-resistant materials applied to particular conditions should be a helpful guide. Other examples can be sought out also. But the important thing is this: Identify and classify the type of wear problem first.

The experience of others will guide you to an initial selection of wear-resistant materials to do a particular job. But these first choices need not be final. They do, however, narrow down the field so that changes to accommodate specific conditions to temperature, moisture, dirt or lubricant can be made more efficiently.

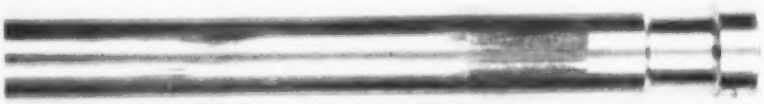
Of these conditions, the most important one to consider is that of lubrication. For any given stress situation, regardless of whether it is high or low, the characteristics of the lubricant film must be accurately assessed. Success or failure of wear-resistant materials hinges on knowing for certain just how the lubricant film behaves on the job.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept. THE IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.



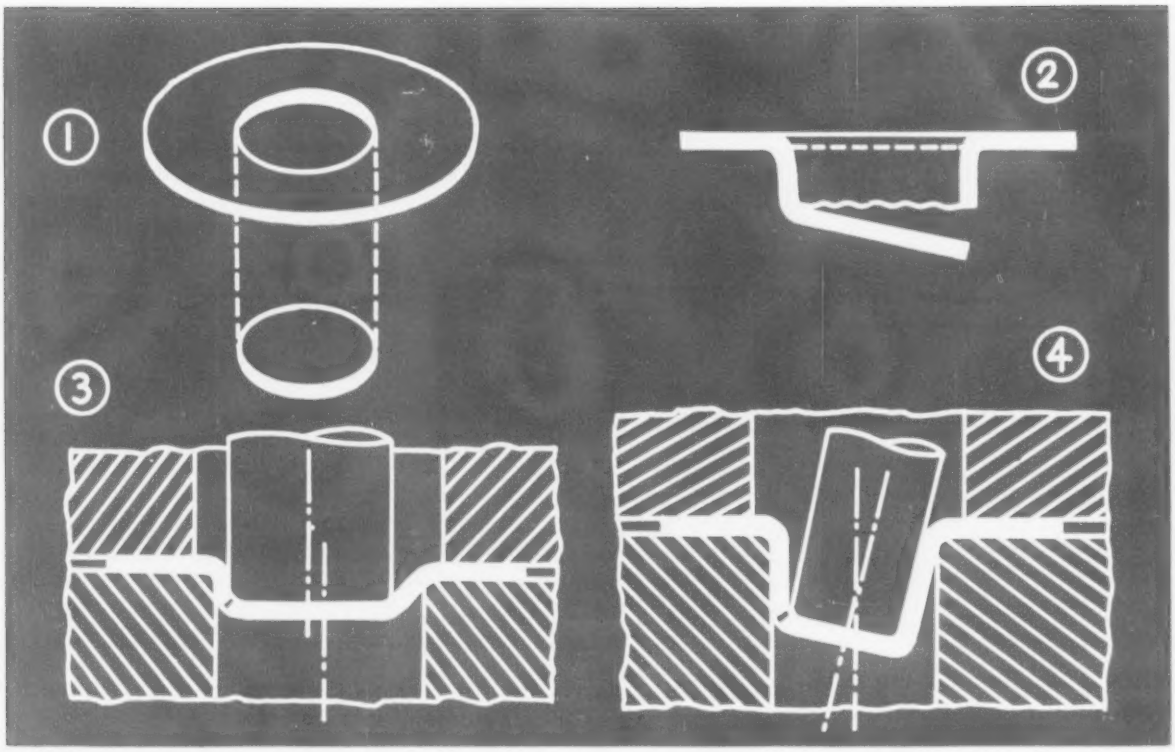
NOT SO GOOD: Wear occurring with a 5-microinch valve stem finish, a very smooth valve guide and no surface treatment on either part.

A BIT BETTER: Valve guide again very smooth, stem surface a little rougher (30-40 microinches), still no surface treatment on parts.



STILL BETTER: Less wear shows when stem was finished to 5 microinches, valve guide was rough-reamed, both parts phosphate coated.

BEST OF ALL: Virtually no wear occurs with a 30-40 microinch stem finish, a rough-reamed guide, and both parts coated with phosphate.



TORN BOTTOMS: Faulty tools and misaligned punches are common causes of bottom tearing, but a number of other factors may also be involved, such as improper clearances, or excessive press-ram speed.

How to Remedy Defects in Drawn Shells

By **Federico Strasser**—Consultant, Santiago, Chile

In many ways, drawing metal shells is still an art. Trial runs can (and often do) produce some tricky problems.

Eight types of defects are most apt to occur. They range from minor wrinkles to bad tears in shell walls.

Here's help on eliminating these irksome troubles.

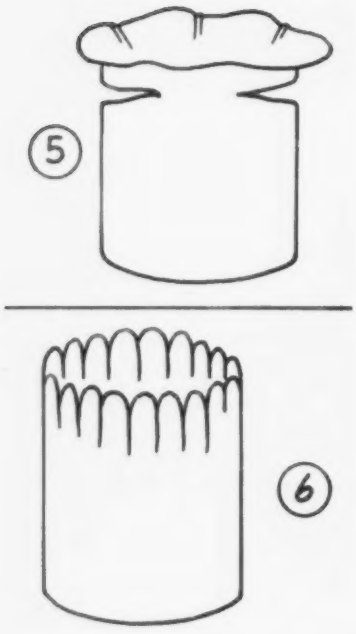
■ Immediate success the first time you draw a metal cup or shell with a new die is a rare occurrence. As a rule, some troubles crop up. The causes of these difficulties must then be tracked down and eliminated.

Defects most apt to appear in the initial stages of shell drawing include: torn bottoms; wrinkles; uneven height; ruptured walls; bulging and buckling; burnished surfaces; scratched, scored or pitted areas; step rings.

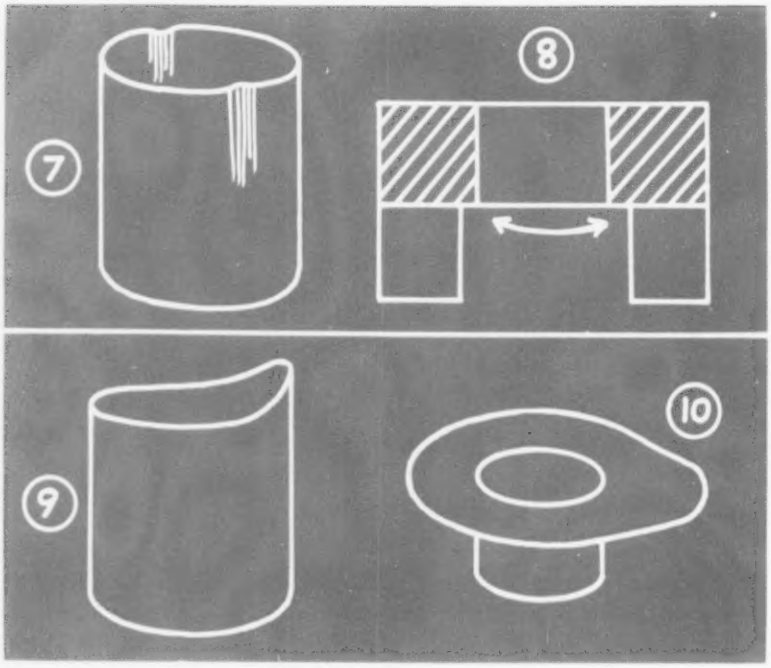
Bottom Torn?—If the bottom area is torn out of the metal before any shell wall is formed (Fig. 1), tool construction is faulty; the drawing tool literally functions as an imperfect die. There may be several reasons, for example: Too small a clearance between the punch and the die opening; too small a drawing radius on the die (or possibly a drawing radius that's poorly blended with the die wall); excessive blank holder pressure; excessive press-ram speed.

If part of the shell wall is formed and the bottom is not entirely severed (Fig. 2), the cause could also be one or more of the foregoing reasons.

Still, other conditions might be responsible, such as: Too high a drawing reduction; too small a rounding radius on the punch bottom; an incorrectly aligned punch (Figs. 3 and 4); poor tool finish (grinding marks, etc.); improper location of the flat blank; a blank that's larger than the die ring or the blank holder; stock of non-uniform



WRINKLES: There are two main types: heavy wrinkles in the un-drawn flange (often with tears just below), and partly flattened wrinkles with ragged edges.

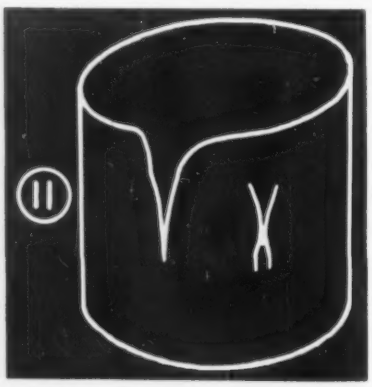


TOP: Slight wrinkling on opposite sides (7) occurs when the die ring is simply set on parallels (8) instead of in a die holder.

BOTTOM: Uneven height and irregular flange may stem from poor-quality stock as well as from errors in blank or die alignment.

thickness, quality or surface finish; incorrect lubrication.

About Wrinkles—The problem of wrinkling on shell walls may occur in two ways. In one case (Fig. 5), heavy wrinkles in the un-drawn flange are often accompanied by horizontal fractures just below the flange. In less severe cases, drawing is successful except for partially ironed-out wrinkles and ragged edges, Fig. 6.



RUPTURES: Breaks in an otherwise well-drawn shell result either from imperfections in the metal or non-concentric punch alignment.

Possible causes of wrinkling are insufficient blank-holding pressure, too large a drawing radius on the die opening, too much clearance between the punch and the die opening, too large a radius at the punch bottom, an overlarge diameter difference between blank and shell, and incorrect blank shape.

If wrinkles are found on only one side of the flange, it's possible that blankholder pressure is not uniform. Or, it may be that blanks are burred on one side so that the metal is not pulled uniformly toward the die opening. This condition can also occur when blanks are not circular.

Just a Little—Sometimes the shell may be slightly wrinkled on opposite sides, Fig. 7. This happens when the die ring is not properly held by a ring-like die holder, but is simply put on two parallels, Fig. 8. This may bend the die ring in the middle, and the insufficient die holding pressure results in wrinkling.

Uneven shell height (Fig. 9) or an irregular flange outline (Fig. 10) may stem from several causes: non-concentric nesting of the blank, uneven blankholder pressure, burred blanks, variations in stock thickness, poor-quality stock, and misalignment of the punch with the die opening.

Ruptures in the wall of a shell which has otherwise been drawn successfully (Fig. 11) are caused by one of two things. Perhaps a small hole, a scratch, an inclusion or some other irregularity in the metal causes a fracture in the highly stressed shell wall. Or it may be that punch alignment is non-concentric.

Bulges Do Happen — Occasionally a shell wall will bulge and the upper end will flare out, Fig. 12. This could result from too much clearance between punch and die. Or, the shell might cling to the punch and become distorted when it is stripped off.

When the bulge is in the bottom of the shell (Fig. 13), the punch is

insufficiently vented for the escape of entrapped air during the drawing process.

Fig. 14 shows a series of small puckers or blisters around the bottom of a shell. These may be caused by insufficient air venting, or by worn or damaged drawing edges on the press tools.

Clearance Is Key—Shells may escape wrinkling or rupturing during the tooling try-out period only to turn up with a wide, brightly burnished ring around the upper wall section, Fig. 15. This simply means that clearance between punch and die is too small.

Outer and inner surfaces of shells may be scratched, also, by punches or die rings that are either poorly polished or "loaded" with particles of scale, stock or other foreign matter. Foreign particles on the stock or in the lubricant can produce the same effect. Sometimes excessive speed of the press ram may be at fault.

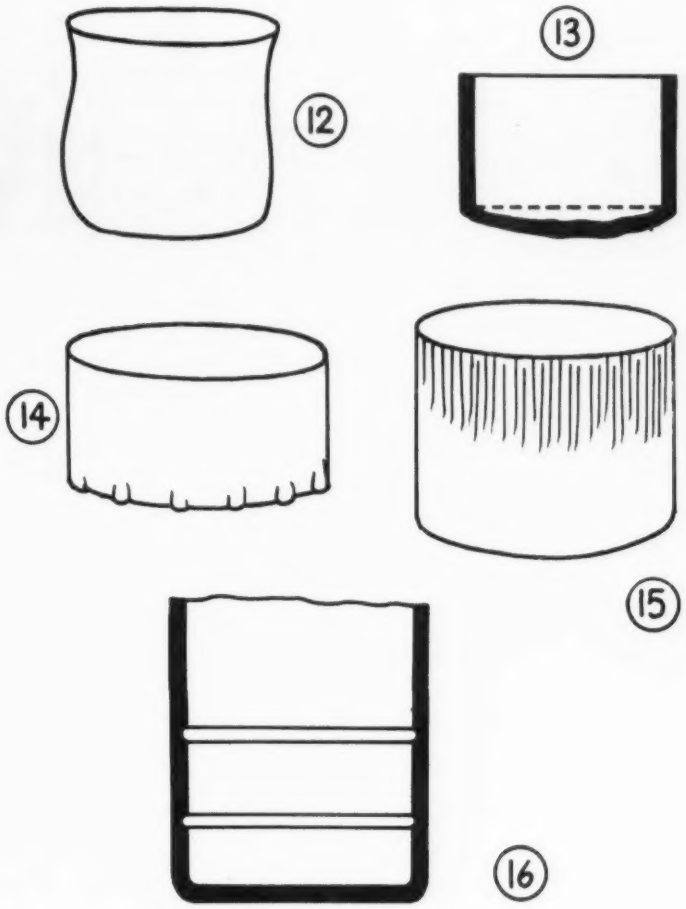
Where deep shell forms are produced in one or more redrawing operations, deep circular depressions may appear in the inner walls, Fig. 16. The possible causes all have to do with too small a radius on the punch bottom, on the blankholders for the redrawing dies, or on the redrawing rings themselves.

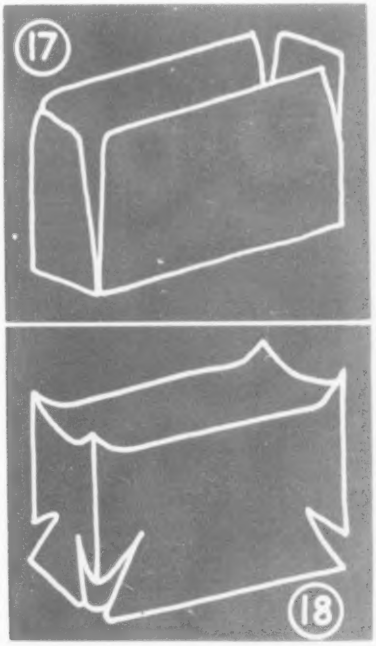
Special Problems—Boxes that are drawn in rectangular or square forms may present a few problems of their own. For example, the corners may be fractured, Fig. 17. In some cases, the shape or size of the flat blank may not provide enough material for corner forming. In others, the clearance between punch and die may be too small.

If the corners of square or rectangular boxes rupture as shown in Fig. 18, blank shape and size may also be at fault. In this case, however, there is too much material provided for the corners.

But where the blanks are properly sized and the trouble persists, it may be that the drawing-reduction proportions are too high. Too high or too low a blank-holding pressure can also cause this type of corner deformation.

If none of the aforementioned possibilities cause the corner defects shown in Figs. 17 and 18, check for the following conditions: too small a radius at punch corners, incorrect nesting of flat blanks, variations in stock thickness, or inadequate lubrication. Trouble may stem from any one of these faults or from a combination of two or more of them.





CORNERS ARE TRICKY: Boxes present special problems. The most common failures occur at corners, quite often because too little or too much blank material is used.

VARIED PROBLEMS: Typical defects include side and bottom bulges (12, 13), small puckers or blisters (14), burnished upper wall (15), and ringed depressions (16).

What to Do About Metal Fires

There's a growing menace in the form of flammable metals. Some of them ignite even on exposure to air, and they react violently to most types of fire-extinguishing agents.

Proper safeguards will help prevent such fires; but if one starts, are you ready to cope with it?

HOT AND SMOKY: Magnesium casting burns violently, makes a brilliant but hazardous spectacle.

▪ Given the right conditions, many metals in everyday use will burn. In fact, certain metals used at elevated temperatures present fire hazards much more severe than those of highly flammable petroleum products.

The first ignitable metal that comes to mind is magnesium, but it's far from alone. Liquid metals are finding ever-widening use in chemical reactions, in alloying of metals and in heat-transfer operations.

Liquid sodium, for example, has long been used as a coolant inside aircraft-engine valves. Diecasters who work with magnesium have found that sodium-filled cores last longer and permit faster operation of the diecasting machine. Mercury and lead also serve as heat-transfer mediums.

Potassium is another, and even more unstable than sodium. Because of its higher cost, potassium is usually alloyed with metallic sodium for heat-transfer applications. NaK mixtures make an excellent bath for research heat-treating furnaces, providing close control of temperatures. The same alloys are used extensively as coolants in atomic-power units.

Calls for New Approach—The result is a new kind of fire hazard, one that can't be met by ordinary means. Many of the liquid metals will ignite spontaneously in air at elevated temperatures. Compound-

ing the problem is the fact that ordinary fire-fighting equipment can't be used—these unstable metals react violently with water and other common extinguishing agents.

Fire-protection specialists will have to learn more about the properties of liquid metals, how to combat metal fires and what protective equipment and extinguishing agents can be used.

From a health, injury and fire-hazard viewpoint, the properties of sodium and potassium are quite similar. Both are solids at room temperatures, while most of their alloys are liquids. Unlike sodium, potassium reacts with air at room temperatures to form peroxides which, under some conditions, may react explosively with organic materials.

Prevent Air Exposure—The most common hazard is exposure of sodium, potassium or NaK alloy to air. The metals will ignite spontaneously in air at temperatures above 329°F. In virtually all high-temperature sodium or NaK systems, a leak will result in a fire.

Because of their violent reaction with water, sodium and NaK should be handled in an area as free as is practical of sprinkler systems, water pipes and steam lines.

Equipment design can contribute greatly toward eliminating or minimizing the severity of a sodium or NaK fire. One of the basic fire-fighting rules is removal of fuel. Sump tanks should be provided to allow dumping the metal from the lowest point in the system in an emergency. Metal drip pans will catch sodium or NaK spills; heat released by metal burning on a concrete floor makes the concrete spall and scatters burning metal over a wide area. Pans also help in disposal of residue after a fire.

Avoid Contact With Skin—Sodium and potassium are alkali metals. Upon contact with the skin, they can cause thermal burns and/or alkali burns. Thermal burns can be treated normally; but in an alkali burn, hydroxide penetrates the skin and must be neutralized with acetic acid or removed before the burn will heal.

COMMON SALT: Sodium fire is quickly brought under control with a special extinguisher that discharges a dry mix of sodium chloride.

When ignited, the temperature of sodium or NaK will rise rapidly to 1500°-1600°F. They give off large quantities of opaque white smoke, making visibility very poor. No flame is visible—just a glowing mass of alkali metal.

Smoke from an alkali metal fire is very irritating to throat and lungs. Breathing equipment will nullify irritation and allow entry into an area contaminated by smoke from a sodium or NaK fire, but proper ventilation should be provided so fire-fighters can see.

Smother With Solids—An alkali metal fire is generally extinguished by removal of oxygen. One of the best fire-prevention measures is a low oxygen concentration in areas where sodium and NaK heat-transfer operations are performed. But this approach is limited to areas which can be sealed. The usual way to exclude oxygen is to cover the burning metals with dry alkali metal chlorides, graphite or soda ash. Most of these materials are applied with a scoop or shovel.

There's also an extinguishing agent for metal fires which can be stored and used from an extinguisher. Called Ansul Met-L-X dry powder, its principal ingredient is sodium chloride—common salt. The material is ground to a select particle size and mixed with other ingredients to make it moisture repellant and free-flowing. It forms a solid, air-excluding crust over the surface of the burning metal.

Extinguishers for its use are made by the same firm—Ansul Chemical Co., Marinette, Wis. They come in a 30-lb capacity hand portable extinguisher, 150- and 350-lb capacity wheeled extinguishers, and in stationary extinguishers up to 2000-lb capacity. The powder can also be discharged through fixed piping with nozzles in the hazardous area.

Whatever the metal hazard, the first step in effective fire protection should be a thorough study of possible preventive measures.

Low-Cost Method Strengthens Iron Ore Pellets

Estimates forecast greater use of low-grade ores.

Emphasis is on how to get economy in processing the ore before shipment.

A new method promises gains in low-cost production of hard, durable pellets.

▪ Processing of low-grade ores before loading avoids expense of shipping unusable waste. With magnetite ore, 3 to 4 tons of ore produce 1 ton of magnetite concentrate. The concentrate in turn is pelletized for shipment.

A new method for pelletizing and heat treating magnetites makes the low-grade ore economical for steel mills. Developed by Allis-Chalmers Mfg. Co., Milwaukee, the method produces pellets suited for blast furnace feed.

Steel and ore mining industries can get lower fuel and maintenance costs, and eliminate pellet breakage. The process should also hasten development of taconite resources.

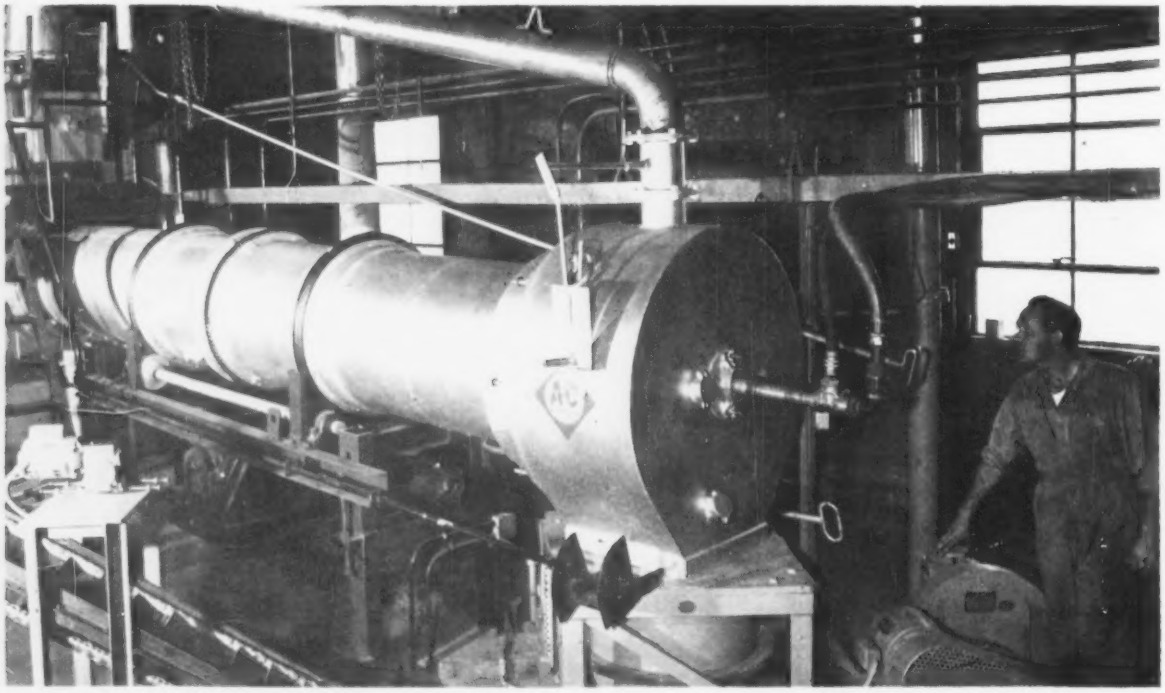
Why Pellets? — Magnetite ore must be crushed to a fine powder to separate iron oxides from impurities for beneficiation. Because the normal draught would blow the powder out of a blast furnace, the ore must be agglomerated and treated.

Allis-Chalmers' process has four steps: Forming the pellets in a balling pan or drum; drying the pellets on a moving grate; heating (partially oxidizing) the pellets; and final burning of pellets in a short rotary kiln.

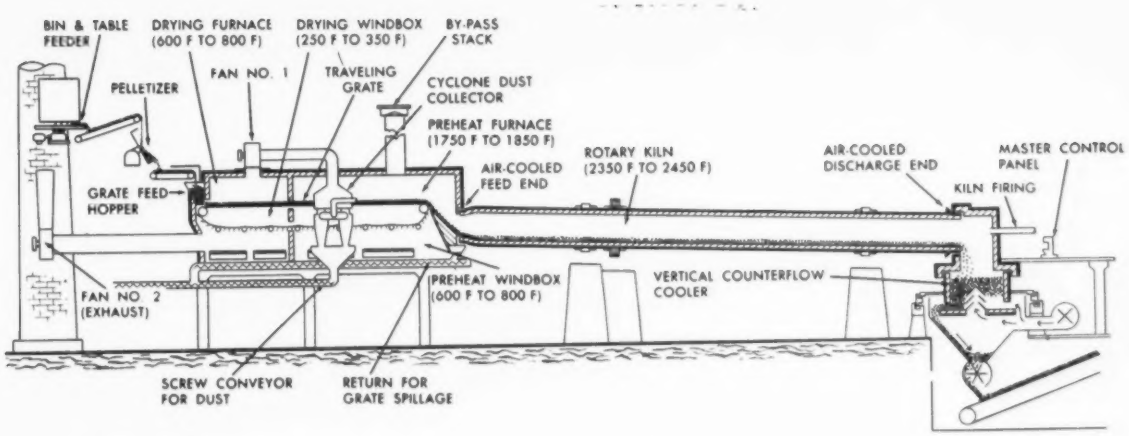
The process begins with the forming of ½- to ¾-in. diam pellets from finely-ground moist magnetite concentrate. Conveyors transfer pellets to a traveling grate in a furnace which is divided into a drying chamber and a preheating chamber.

Preheat Pellets — By subjecting the pellets to a downdraft of hot gases, exhausted from the preheat chamber at 600° to 800°F, the drying chamber drives off moisture. The gases exhaust to the atmosphere at 250° to 350°F.

On passing to the preheat chamber the pellets receive a downdraft of highly oxidizing gases (1750° to 1850°F) from the rotary kiln. Oxidation from magnetite to hematite starts. Individual grains of transformed hematite bridge together by



PILOT PLANT: Prototype equipment at Allis-Chalmers tests ore samples to predict operating conditions.


BIN & TABLE FEEDER
DRYING FURNACE (600 F TO 800 F)
DRYING WINDBOX (250 F TO 350 F)
BY-PASS STACK
PELLETIZER
FAN NO. 1
TRAVELING GRATE
CYCLONE DUST COLLECTOR
PREHEAT FURNACE (1750 F TO 1850 F)
ROTARY KILN (2350 F TO 2450 F)
AIR-COOLED DISCHARGE END
MASTER CONTROL PANEL
KILN FIRING
AIR-COOLED FEED END
GRATE FEED HOPPER
PREHEAT WINDBOX (600 F TO 800 F)
VERTICAL COUNTERFLOW COOLER
FAN NO. 2 (EXHAUST)
SCREW CONVEYOR FOR DUST
RETURN FOR GRATE SPILLAGE

CONTINUOUS PROCESS: Overall length would be 250 to 325 ft for a 3000-ton per day plant.

grain growth and recrystallization to form a mineral structure.

By reaction ($4\ Fe_3O_4 + O_2 \rightarrow 6\ Fe_2O_3$), the pellets develop crushing strength of 100 to 200 lb to withstand the tumbling action in the kiln. There's no bridging between individual pellets due to the small area of surface contact.

Develop Crystals—Highly heated gases in the rotary kiln complete the development of hematite crystals. Temperatures range from about 2350° to a limit of 2450°F to insure optimum strength.

Pellets are then cooled to recover sensible heat. The small amount of dust and fines in the kiln travels along with hot kiln gases and filters out as the gases pass through the bed of pellets on the grate.

The product withstands an ASTM drum-tumbling test with virtually no broken pellets and only 1 to 5 pct fines (minus 28 mesh).

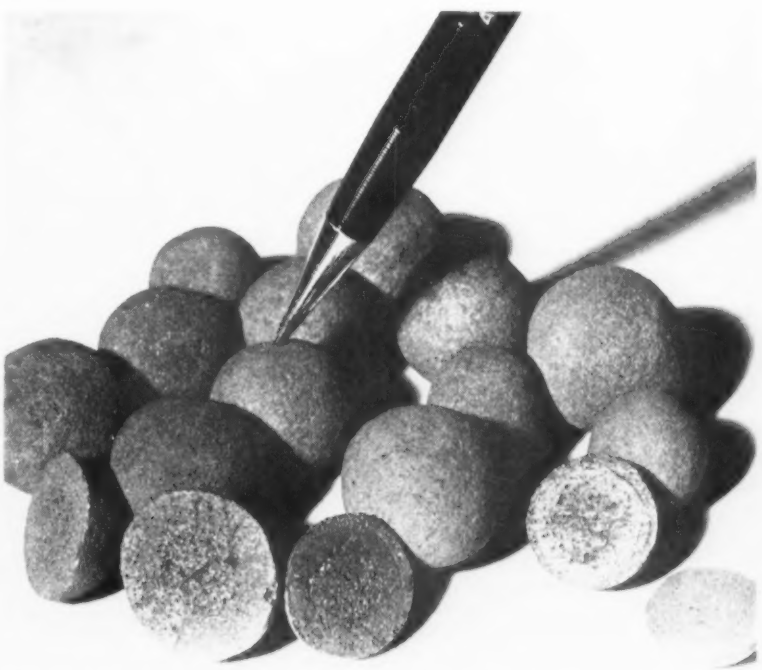
Fuel economy of the system results from the efficient reuse of exhaust from one stage to support reactions in others. The hot air from cooling the hardened pellets is used as secondary combustion air.

Each step uses gases from a higher heat zone to get maximum efficiency. Kiln gases at 1800°F pass to the pre-heat chamber and exhaust at 600° to 800°F into the drying chamber.

Fuel consumption is reduced to about 750,000 Btu per net ton. At the same time, operating and maintenance costs are expected to be in line with the efficient fuel economy.

Scale Tests—Following preliminary research work, Allis-Chalmers' engineers tested and evaluated the new process at pilot plant facilities at Carrollville, Wis. All stages of pelletizing and burning were duplicated for multiple-ton sample batches.

The facilities are set up to test ores from many different mining operations. Further research is being done to modify the process for hematite ores.



READY FOR SMELTING: Porous structure aids in reduction to pig iron when pellets are smelted in blast furnace.

Gage Tightens Control Of Wire Coating Process

In wire coating, the very speed of the process precludes effective manual control.

It takes continuous measurement of diameter fed directly to control units to do the job right.

The benefits go beyond keeping tolerances; there are savings in material, also.

▪ Precise control in coating plastic insulation on copper wire at a leading wire manufacturing plant is producing a better product. Not only does it improve quality, but the setup reduces waste of plastic by preventing excessive coating.

Used on two of the wire coating machines at the plant, the controls have paid for themselves in the first year of use. The setup consists of continuous gaging and control units.

The most usual insulation is polyvinyl chloride, applied to the wire in a screw-type extruder at 360°F. Nylon is also used.

As it leaves the extruder, the wire, ranging from No. 26 to 12, goes through a water bath that cools and hardens the plastic. Draw speeds range up to 2000 fpm.

Drawbacks in Hand Control— The continuous gages and controls replace manual methods. The operator used to measure the diameter with micrometers while the wire was "on the fly."

He would check at intervals and adjust the wire-draw speed manually if the wire was out of tolerance. But this method had drawbacks: Between measurements, wire diameter may change; men working on different shifts were getting variations in the "feel" of micrometers; a heavier coating than required had to be applied to guarantee that Underwriters' specifications were being met.

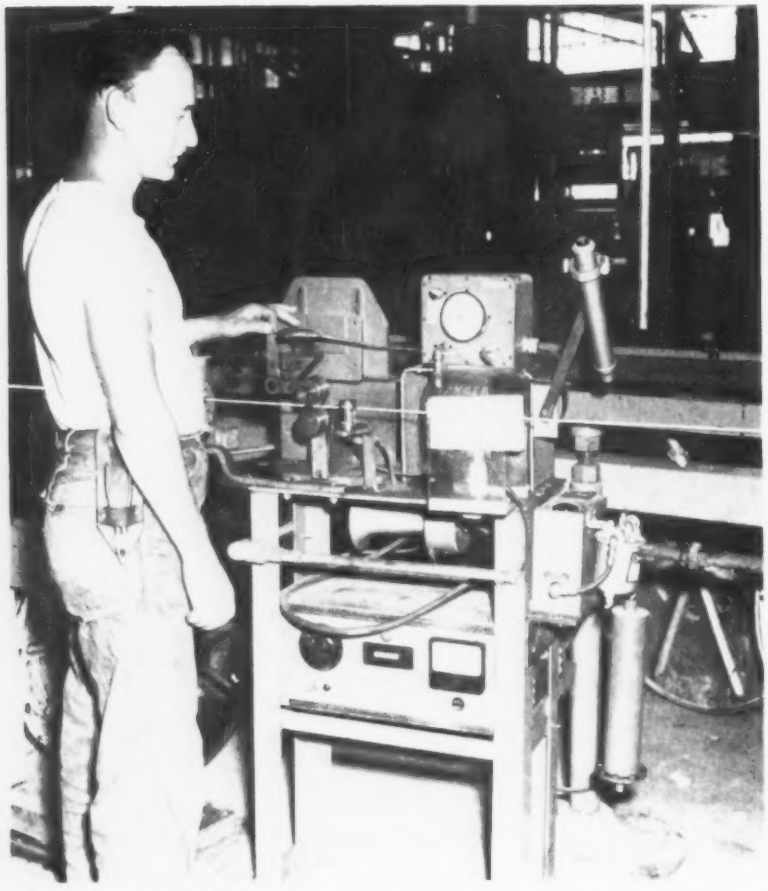
The extra insulation on aircraft electrical wire sometimes prevented it from passing through narrow channels. On No. 18 solid wire, the yearly waste of plastic insulation ran as high as $5000.

Continuous Measurement — To get around these disadvantages, the company installed gages made by Federal Products Corp., Providence. The gages measure the wire after it has passed through the water bath.

If the wire is out of tolerance, the controls automatically change the speed of the wire through the extruder. Speed determines coating thickness.

By its continuous action, the gage checks drift towards a heavy or light tube. Manual methods were not able to control this drift.

Meets Tolerances — With gage control, the plant can run at a tight



ROLLERS MEASURE: As wire passes through gage, upper roller transmits signal to air-electric unit, where dial indicates reading.

tolerance of ± 0.002 in. It's well within the usual tolerance of ± 0.003 in. The control adds or subtracts insulation in increments of 0.0005 in.

By consulting the instruction card furnished with each batch of uncoated wire, the operator sets the gage. With a micrometer, he measures the wire and zeroes the gage at the beginning of the run.

If possible, the machine is run continuously until the job has been completed to eliminate any variables by machine stoppage. As soon as a reel is full, another takes over automatically.

How It Works—The continuous setup consists of two units: the gage head, which actually measures the wire and transmits size variations, and the control portion, which regulates the draw speed of the wire.

The gage head includes a pair of rollers through which the wire passes. With the lower roller fixed, the upper roller moves vertically to follow diameter of wire.

An AirProbe in the head transmits the wire diameter to an air meter. When either upper or lower control limit is reached, electrical switching energizes the control portion.

A signal unit in the control portion provides a visual indication of wire condition through three lights, labelled: "under," "good," and "over."

Takes Average Diameter—A time delay mechanism in the signal unit damps out surface irregularities to give the average diameter. It does this by correcting only when the wire is out of tolerance for a period of time, adjustable from 0 to 4 seconds. At low speeds, it's desirable to decrease the damping and at high speeds to increase it.

In the control unit a motor-run rheostat governs the length of time the jogging motor operates to change the capstan speed. Running time ranges from 0.1 to 1.0 seconds.

It's a G. E. speed variator at the capstan with a motor-operated rheostat that controls the speed of the jogging motor.

A gage-off rheostat governs the length of time between successive corrections. The wire runs from tubing head to gaging head before the next correction is made. This way, the gage cannot correct more than once for the same condition.

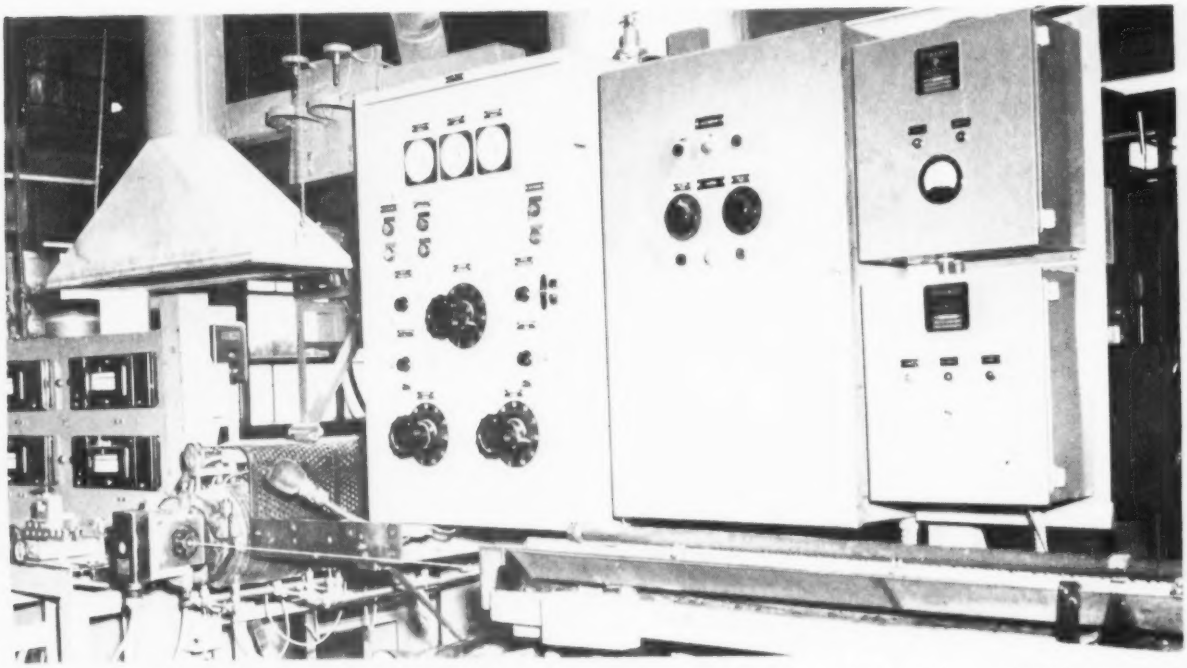
The rheostat is adjusted so that the gage will come back into operation only after the wire that was coated during the control adjustment reaches the gaging head.

When correction is made, the "good" light flashes on and remains on as long as the wire stays within limits.

Tests of Finished Product—Samples of coated wire are tested after the full reel leaves the machine. The diameter, wall thickness, and density are checked.

Wall thickness measurement shows if the wire is centered in tube. It's done by removing the insulation from a small section and checking it on a thickness gage.

Density is found by immersing the material in various solutions with different specific gravities. Density is affected by trapped gases, which volatilize and expand from the head of the extruder.



SPEED CONTROLS COATING: The signal from the roller gage feeds into control cabinets (right) to keep coating within close tolerances by controlling speed of wire through extruder (left).

Copper-Base Alloy Compares With Nickel Silver

By C. H. Hannon—Metallurgical Engineer, Transformer Labs. Dept., General Electric Co., Pittsfield, Mass.

In a few years there should be more than enough nickel to meet any crisis.

Meanwhile we're vulnerable; it'll take all the ingenuity we can muster to find suitable substitutes.

A good example of what can be done is this copper-base alloy for elevated temperatures.

▪ Certain copper-base alloys, modified with zinc or aluminum, make an effective substitute for 18 pct nickel silver at operating temperatures up to 1000°F. This fact was brought out in a recent study aimed at finding an alternate material that isn't as dependent on the current short supply of nickel.

Emphasis throughout the search was on low cost, fabrication ease, good mechanical properties and oxidation resistance over the entire service temperature range. Scaling can be tolerated if the oxide film doesn't flake off on repeated heating and cooling.

The field of possibilities was narrowed by first giving qualitative oxidation tests to a large number of alloys. Mechanical properties of the most promising could then be tested and a tentative selection made.

Initial oxidation tests were run on copper, gilding-metal, red brass, yellow brass, commercial 18 pct nickel silver and several other alloys. A 10 pct Ni alloy (cupronickel) was also included.

Additional Alloys—Previous research by the author led to discovery of alloys now covered by U. S. Patent 2,744,822 ("New Copper Alloy Has High Stress-Corrosion Resistance," The IRON AGE, November 20, 1952). An alloy within the claims of this patent, called Strenicor, has a nominal composition of 4.5 pct Ni, 1.0 pct Si, 0.5 pct Fe and the balance essentially copper.

The project was extended to include a series of modified Strenicor compositions in which part of the copper was replaced by additions of 3 to 23 pct Zn. Since substitution of other metals for copper might affect the nature of the oxide film, cadmium, magnesium, silver and aluminum modifications were also tried.

All Strenicor compositions were prepared by chill casting, then surface grinding and finally hand polishing with 400-A Speed-Wet Durite paper. The other specimens were selected from cold-rolled strip and cold-drawn rod or tubing, the surface of which was similarly finished with 400-A paper. Without regard to shape or size, test pieces were exposed in a small, electrically heated laboratory muffle. An air atmosphere prevailed throughout the tests.

Variations in oxidation reaction were so pronounced that a difference in testing temperature from 1000° to 1100°F wasn't significant.

Table I
Effect of Zinc in Strenicor Alloys

ALLOY	OBSERVATION
Stren-M-3 Zn	Developed a very loose scuffy black scale.
Stren-M-6 Zn	Formed a thin but loose black scale.
Stren-M-10 Zn	Revealed an iridescent film showing yellow, brown and green colors.
Stren-M-13 Zn	Formed a very adherent thin yellow film.
Stren-M-23 Zn	Developed an extremely thin adherent straw-yellow film.
	Note: Samples were exposed at 1100°F for 24 hours.

Table II
Effect of Aluminum in Strenicor Alloys

ALLOY	OBSERVATION
Stren-M-0.75 Al	A loose, flaky black scale was present.
Stren-M-2.0 Al	Formed a black film, somewhat adherent.
Stren-M-3.0 Al	Developed a dark-colored and quite adherent film.
Stren-M-3.5 Al	A thin, adherent dark film had formed.
Stren-M-4.0 Al	A very thin, dark-colored and very adherent film was present.
Stren-M-5.0 Al	An extremely thin and adherent dark-colored film had formed.
	Note: Samples were exposed at 1000°F for 96 hours.

The rate of film formation and nature of the oxide, classified by its degree of adherence and thickness, was consistent in spite of variations in exposure time.

Form Poor Films — The oxide formed on commercial copper, gilding-metal, and red brass was an exceptionally free-scaling, blistering type of black scale. Films of appreciable thickness would form on exposure at 1000°F for as little as one hour. Yellow brass produced a powdery, non-adherent yellowish-green coating; it was not only unsightly, but would undoubtedly continue to progress with time. The result on 10 pct cupro-nickel, obtained after an exposure of 24 hours at 1000°F and also in a second check at 750°F for 24 hours, was a distinctly free-scaling coating.

Service experience with 18 pct nickel silver was confirmed by a test at 1000°F for a period of 65 hours. A dark, firmly adhering thin scale was formed.

Samples of Strenicor containing 4.5 pct Ni, 1 pct Si, 0.5 pct Fe and the balance copper were tested at 1000° and 1100°F for periods of 2 hours to 24 hours. The result was a very free-scaling black oxide. Alloys made by modifying Strenicor with varying amounts of zinc produced the results listed in Table I after exposure at 1100°F for 24 hours.

Zinc additions between 10 and 15 pct appear to be optimum; higher amounts adversely affect mechanical properties.

Hard to Forge—Other Strenicor modifications were tested—samples in which part of the copper was replaced with varying amounts of cadmium, magnesium, silver and tin. Some beneficial effects were noted in the oxide films, but all of the alloys proved difficult or impractical to hot forge.

The final series of alloys tested were Strenicor modified by replacing corresponding weight percentages of copper with aluminum. These were subjected to 1000°F for 96 hours, with the results listed in Table II.

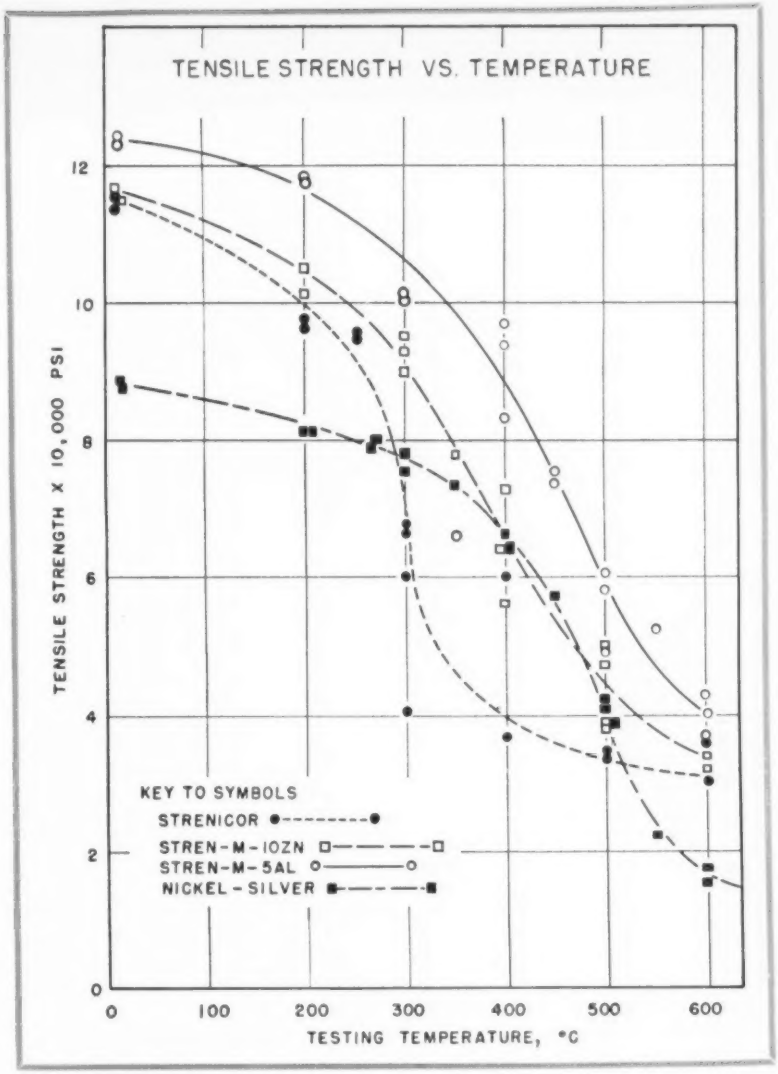


FIG. 1: Aluminum-modified Strenicor developed highest tensiles over the entire temperature range; zinc-modified alloy is a close second.

Much less aluminum is needed to produce oxide films comparable to those obtained with zinc. The optimum aluminum addition is 4 to 5 pct.

Checks Properties—To compare mechanical properties at elevated temperatures, 12-lb charges of Stren-M-10 Zn and Stren-M-5 Al were induction-melted and chill cast in a cast-iron mold that had been washed with a clay-graphite suspension. Ingot tops were sawed off to remove the pipe and the ingots were hot forged to ¾ in. diam bars. Surface imperfections were removed by grinding, after which the bars were solution heat-treated in air at 850°C for an hour and water quenched. Test pieces cut from each bar were then aged in air at 500°C for 2 hours.

The ¾ in. diam bars in the quenched condition were cold drawn to ⅜ in. diam, then age-hardened at 500°C for 2 hours.

Unmodified Strenicor was cast, forged, and drawn to ⅜ in diam bars, solution heated at 900°C for an hour, water quenched and aged at 540°C for 2 hours. Nickel-silver

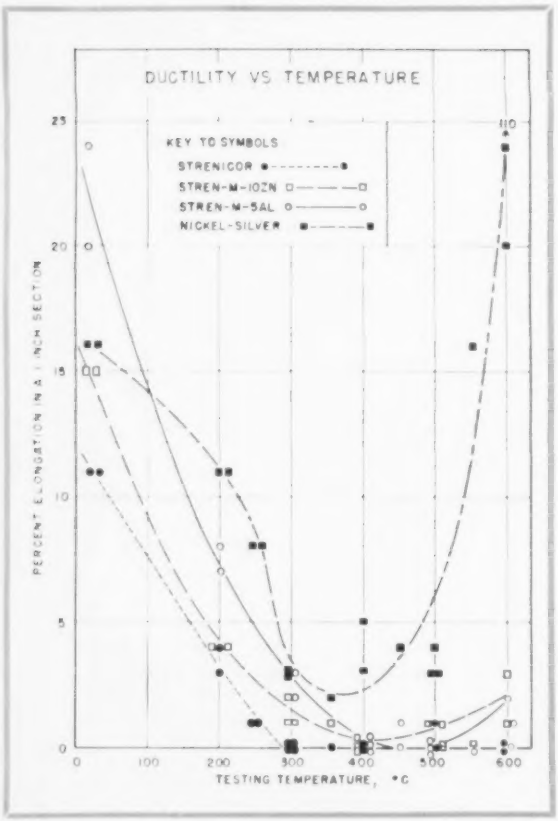


FIG. 2: Strenicor alloys are considerably less ductile than nickel silver, but proved superior in strength as well as resistance to oxidation.

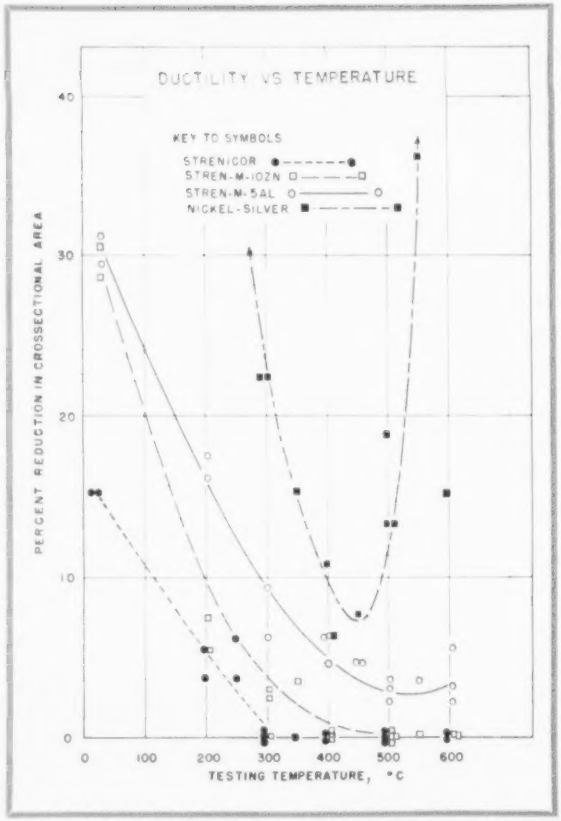


FIG. 3: Lower ductility of all Strenicor alloys is again evidenced by reduction in area. Unmodified Strenicor displays low notch-sensitivity.

was prepared in the form of ⅛ in. diam bar, commercial hard temper. And finally, 18 tensile bars were machined from each of the four alloys.

Test at Temperature — Equipment for high-temperature tensile testing consisted of a rack of 6 portable furnaces, each with a recorder-controller, and a tensile machine equipped to hold one of the portable furnaces. A tensile bar with grips already attached was placed in each furnace, and a chromel-alumel thermocouple from the recorder-controller was wired to the gage section of each tensile bar for temperature control.

After the bar had been at testing temperature ± 10°F for 15 minutes, the furnace was transferred to the tensile machine and the bar was pulled in tension to failure. Maximum load was recorded and the tensile strength calculated. Elongation and reduction in area of the broken bars were measured.

Results of the tests are plotted versus temperature in Figs. 1, 2 and 3. Although many bars failed across the threads and shoulder, tensile strength was calculated by dividing maximum load by initial area across the gage section. While the average stress across the shoulder or threads was lower than this, the concentrated stress must have been somewhat greater or the specimen would not have failed outside the gage length.

Actually Stronger—A large number of specimens failed at the punch markings of the gage section, or between the punch marks and the shoulder of the specimen. In both of these cases failure probably occurred where it did because of stress concentration; thus many of the failures occurred below the true tensile strength of the material and indicate only minimum values.

It appears that the decreasing order of notch sensitivity (increasing order of resistance) is Strenicor, Stren-M-Zn, Stren-M-Al and nickel silver. This is also the order of increasing ductility.

From the standpoint of both strength and ductility, the aluminum modified alloy is the best of the new materials tested. While its ductility is considerably lower than nickel silver, its strength is greater. It also appears to be best in resistance to oxidation.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

FREE TECHNICAL LITERATURE

RED CIRCLE SERVICE . . . . . FOR QUICK HANDLING OF SPOT REQUIREMENTS

Acme-Newport has instituted Red Circle Service to meet the many demands for quick handling of spot requirements. Every copy of your order is plainly red circled to ensure preferential attention throughout the processing.

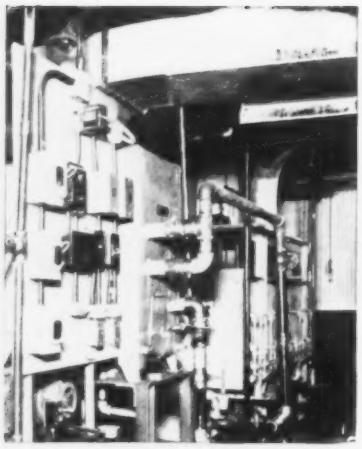
Red Circle Service represents an effective combination of good scheduling, modern facilities, personal attention to quality and service, and the flexibility of operation inherent in a mill of this size. It permits customers to exhaust old inventories without the hazard of delayed delivery of new tonnage.

This service already has proved itself to satisfied customers who are the very life blood of Acme-Newport. Use Red Circle Service to balance *your* inventories with early deliveries of flat rolled steel made to your exact specifications.

PRODUCTS OF
ACME-NEWPORT STEEL

HOT ROLLED STEEL IN COIL
HOT ROLLED PICKLED STEEL IN COIL
HOT ROLLED SHEETS
HOT ROLLED PICKLED SHEETS
COLD ROLLED STEEL IN COIL (*Full Hard only*)
COLD ROLLED SHEETS
ALLOY SHEETS AND PLATES
PLATES (*3/16" and lighter*)
ELECTRIC WELD LINE PIPE

Acme-Newport Steel COMPANY
NEWPORT, KENTUCKY
A SUBSIDIARY OF ACME STEEL COMPANY



Improve Quenching and You Get Better Heat Treating

● The NIAGARA *Aero* HEAT EXCHANGER transfers the heat from the quench bath to atmospheric air. It never fails to remove the heat at the rate of input, giving you real control of the quench bath temperature. This prevents flashing of oil quenches. In all cases it improves physical properties, saves loss of your product from rejections and gives you faster production, increasing your heat treating capacity. You can put heat back into the quench bath to save the losses of a "warm-up" period.

Savings in piping, pumping and power as well as great savings in cooling water return the cost of the equipment to you in a short time. The Niagara *Aero* Heat Exchanger saves nearly all of the water consumed by conventional cooling methods.

For the complete story of other benefits and savings, write for Bulletins 120 and 132.

NIAGARA BLOWER COMPANY
Dept. IA-11, 405 Lexington Ave.
NEW YORK 17, N. Y.
District Engineers in Principal Cities of U. S. and Canada

FREE TECHNICAL LITERATURE

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 143.

Monthly Memo Book

A pocket-size publication features 20 pages of supervisory reading in addition to organized memo pages designed specifically for the foreman or supervisor. It's issued monthly on subscription. (Executive's Service, Inc.)
For free copy circle No. 1 on postcard, p. 143

Welding Handbook

Those who weld low alloy high-tensile steels will be interested in a 64-page handbook for welding. It will aid in determining the type of electrode and method of welding to insure that a fabricated part will have the mechanical properties of the base steel. (Alloy Rods Co.)
For free copy circle No. 2 on postcard, p. 143

Turret-Type Drill

Featuring automatic clamping, a power-indexing turret-type drill is covered in a new folder. The publication also lists convenient accessories to the drill. (Burg Tool Mfg. Co.)
For free copy circle No. 3 on postcard, p. 143

Line of Alloys

A specialized producer of metals, master alloys, and ferro alloys has published a new 20-page brochure. It lists each of the various grades along with chemical analysis and standard sizes. (Shieldalloy Corp.)
For free copy circle No. 4 on postcard, p. 143

Core Ovens

Cores are cured in minutes instead of hours in a line of dielectric core ovens. An 8-page bulletin tells how dielectric heating works and lists the standard models of core ovens. (The Foundry Equipment Co.)
For free copy circle No. 5 on postcard, p. 143

Faucets and Fountains

A 28-page booklet covers industrial drinking fountains, electric water coolers, emergency eye-wash and drench shower equipment, flush valves, and faucets. (Haws Drinking Faucet Co.)
For free copy circle No. 6 on postcard, p. 143

Milling Machines

Tracers control the feeds on a new series of non-ferrous milling machines. The high-rpm milling heads get spindle speeds ranging from 1750 to 15,000 rpm. A 24-page catalog includes data on machine specifications and work capacities. (Onsrud Machine Works, Inc.)
For free copy circle No. 7 on postcard, p. 143

Quality Balls

A new bulletin provides specification, application, and design data on balls of chrome steel, stainless, brass, bronze, and monel in various grades, ranging from 1/16 to 4 1/2 in. diam. (Hoover Ball and Bearing Co.)
For free copy circle No. 8 on postcard, p. 143

Variable Speed Belts

For designers, engineers, and plant maintenance personnel a new reference handbook gives cross-reference information on a line of V-belts for every type or make of unit. (Dayton Rubber Co.)

For free copy circle No. 9 on postcard, p. 143

Blast Cleaners

Short case histories in a new 34-page brochure relate the experiences of more than 50 companies in solving special cleaning problems. (Wheelabrator Corp.)

For free copy circle No. 10 on postcard, p. 143

Angle-Iron Shear

A new bulletin describes an angle-iron shear and two allied tools, a bender and a notcher. It tells how the three tools can be combined into one for a total floor space of 21½ by 26 in. (Whitney Metal Tool Co.)

For free copy circle No. 11 on postcard, p. 143

Two-Way Radio

Business and industry can benefit from two-way radio. A new brochure shows how radio fits in, stating how far the user can talk and covering licensing, dependability, and engineering. (General Electric Co.)

For free copy circle No. 12 on postcard, p. 143

Investment Castings

An 11 by 17-in. chart tabulates the composition and physical properties of alloys commonly used for investment castings. (Alloy Precision Castings Co.)

For free copy circle No. 13 on postcard, p. 143

Induction Heating

A new 12-page booklet covers induction heating equipment for forging, hardening, annealing, and metal joining. (Westinghouse Electric.)

For free copy circle No. 14 on postcard, p. 143

Surface Grinder

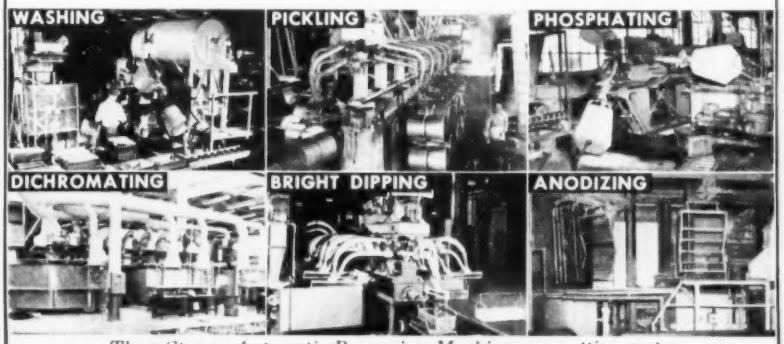
A new precision surface grinder line is described in a catalog, list-

THE FINISHING TOUCH

A. B. HOEFER, *Vice-President,* FREDERIC B. STEVENS, INC.

AUTOMATIC IMMERSION PROCESSING RESULTS IN REAL SAVINGS!

MORE AND MORE, PROCESS ENGINEERS are recognizing the money savings to be realized from automatic processing installations, i.e. *Anodizing and other aluminum immersion treatments; Blackening; Bright Dipping; Dichromating; Cleaning; Pickling; Washing; Phosphating* for rust prevention; wear resistance, and prior to cold drawing; *Stripping* as well as *Electroplating.*



These Stevens Automatic Processing Machines are cutting costs.

"PROFIT-MAKING MACHINES" was one term recently used by a Stevens Automatic Machine user. Money saved in labor, floor space, production control and similar costs, if tacked on the other end, could very easily be termed "profit."

IN ANALYZING AUTOMATIC MACHINE USERS at Stevens for the past three years we were interested in the increased number of processing applications which manufacturers are adapting to this versatile equipment.

AUTOMATION HAS INFLUENCED THESE INCREASES, for our automatic machines fit ideally into "straight line" production layouts and eliminate handling and human error so costly in today's modern manufacturing techniques. All of our machines can be equipped with automatic load and unload features and have flexibility which enables them to be used for a variety of metal treatments.

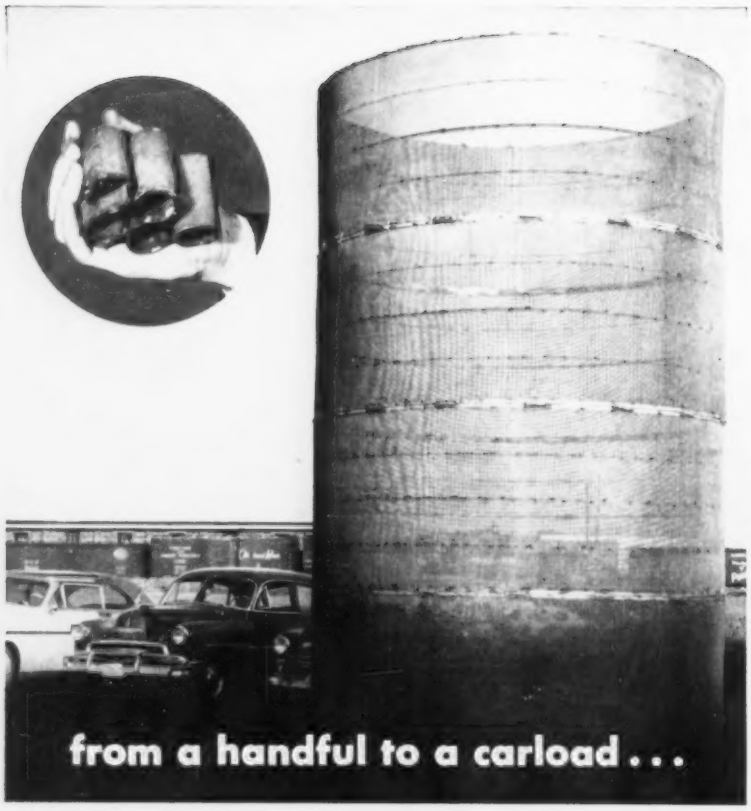
IF YOU ARE A PROCESS ENGINEER, or occupy a similar post of responsibility in your plant, contact your Stevens sales engineer or write for more information on automatic immersion processing as well as electroplating. Let us show you how you can recommend methods to save your company money. Write: Frederic B. Stevens, Inc., 1800 Eighteenth Street, Detroit 16, Michigan.

FREDERIC B. STEVENS INCORPORATED
YOUR METAL FINISHING SUPERMARKET
DETROIT 16, MICHIGAN

STEVENS 75 YEARS OF SERVICE

WAREHOUSES AND OFFICES IN PRINCIPAL CITIES

DRAW BENCHES



Cambridge offers you complete wire cloth fabrication facilities

From giant retaining screens for catalysts or filter media to small strainer assemblies for Diesel engines, fabrication of wire cloth parts to a wide variety of demands is a daily operation at Cambridge. Whatever your needs . . . filter leaves, strainers, sizing screens, retaining screens . . . you can rely on Cambridge for quality and prompt service. We'll work from your prints or draw up prints for your approval.

IF YOU BUY WIRE CLOTH IN BULK, we can give you immediate delivery from stock on large or small orders from the most frequently used types of cloths . . . from the finest to the coarsest mesh.

Accurate mesh count and uniform mesh size are assured by individual loom operation and careful inspection just before shipment.

Let us quote on your next order for wire cloth. Call your Cambridge Field Engineer—he's listed under "Wire Cloth" in your classified telephone book. Or, write direct for FREE 90-PAGE CATALOG and stock list giving full range of wire cloth available. Describes fabrication facilities and gives useful metallurgical data.

The Cambridge Wire Cloth Company

WIRE CLOTH | WOVEN WIRE CONVEYOR BELTS | WIRE CLOTH FABRICATIONS

DEPARTMENT A, CAMBRIDGE 11, MARYLAND

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

FREE LITERATURE

ing capacities, weights, and specifications. (Abrasive Machine Tool Co.)

For free copy circle No. 15 on postcard, p. 143

Extension Arbors

Two hundred and fifty styles and sizes of extension arbors for internal grinding spindles and milling spindles are listed in a new 30-page catalog arranged for quick reference. (Pope Machinery Corp.)

For free copy circle No. 16 on postcard, p. 143

Zirconium

Applications and properties of commercial-grade zirconium metal is the subject of a new booklet. Commercial-grade zirconium has the same corrosion properties as reactor-grade zirconium, but is available at lower price and in quantity. (Columbia-National Corp.)

For free copy circle No. 17 on postcard, p. 143

Mill Products

Covering a full range of shapes, sizes, and alloys, a new 12-page technical brochure reviews in detail mill products in aluminum, titanium, and other metals. (Harvey Aluminum Sales, Inc.)

For free copy circle No. 18 on postcard, p. 143

Ring and Circle Shear

Pushbuttons bring ease of operation by cutting out hand feeding of cutters into plate. A new bulletin describes the built-in motor controls. It tells how other special features make short work of circular cutting jobs. (Niagara Machine & Tool Works.)

For free copy circle No. 19 on postcard, p. 143

Stresses in Steel Bars

A convenient pocket-sized book covers the subject of residual stresses in cold-finished steel bars. (La Salle Steel Co.)

For free copy circle No. 20 on postcard, p. 143

DRAW BENCHES

Single & Dual Chain

Single, Double, Triple & Five Draw

Wire Drawing Blocks

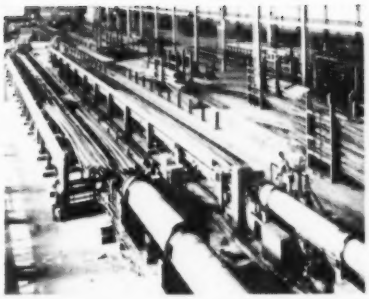
Loading Racks

Draw Bench Chains

Pinch Rolls

Carriage Head (Air-Operated)

Hooks (Air-Operated)



5-DRAW

COLD DRAW EQUIPMENT

for TUBES · BARS · SHAPES

Piercing Mills

Bull Blocks

Cold Reducing Mills

Squeeze Pointers

Rotary Bar Pointers

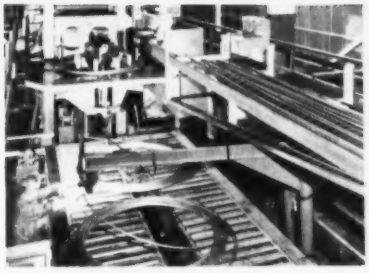
Run-Out Tables

Gag Straightening Presses

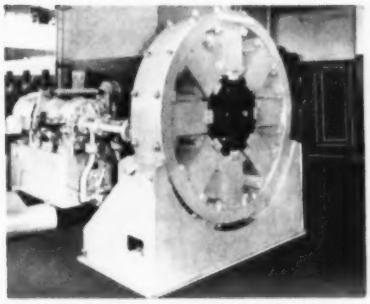
Rotary Roll Straighteners

Cracker Shears

Bar Shears



BULL BLOCK



SQUEEZE POINTER

AETNA • STANDARD

THE AETNA-STANDARD ENGINEERING COMPANY

GENERAL OFFICES: PITTSBURGH, PA. PLANTS: ELLWOOD CITY, PA., WARREN, OHIO

CONTINUOUS GALVANIZING LINES • CONTINUOUS ELECTROLYTIC TINNING LINES • SIDE TRIMMING AND SHEAR LINES AND OTHER FINISHING EQUIPMENT • CONTINUOUS BUTT WELD PIPE MILLS • SEAMLESS TUBE MILLS • DRAWBENCHES AND OTHER COLD DRAW EQUIPMENT • ROLLS AND CASTINGS • EXTRUDERS, MILLS, PRESSES FOR RUBBER AND PLASTIC

TOOL LIFE SOARED FROM 25 TO 750 PIECES

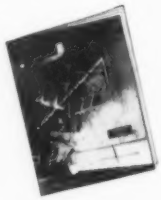
WITH ARISTOLOY LEADED

Counterboring 8 lb. forging was costly for large steering gear manufacturer

Excessive tool breakage was running into hundreds of dollars per month for a large automobile parts manufacturer. On 2.17" ID counterboring operation of this forging made from A.I.S.I. 5120, chips were long and continuous. They wrapped around the tool, fouling it and causing premature tool failure. Tool life averaged only 25 pieces per tool.

A change to Leaded Aristoloy 5117 brought about an immediate improvement not only in tool life but in increased production and vastly improved finish. Tool life was upped to 750 pieces per tool. Spindle speed was increased from 113 to 239 R.P.M. and feed from .007 to .0134 I.P.R.

If you have a problem involving counterboring or deep hole drilling, call your nearest Copperweld district office. We will be glad to have a field metallurgist, experienced in application of lead treated steels, work with you.



JUST OFF THE PRESS

New Leaded Steel Catalog.
Write for your copy today.

ARISTOLOY STEELS

COPPERWELD STEEL COMPANY • Steel Division
4001 Mahoning Avenue • WARREN, OHIO

EXPORT: Copperweld Steel International Co., 225 Broadway, New York 7, N.Y.

FREE LITERATURE ... chines, tackle, straightening, jobs

FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Hard-facing Electrodes

The chemical composition, some properties typical applications, and packaging for 12 of a company's electrode alloys are described in an 8-page booklet. (Haynes Stellite Co).

For free copy circle No. 21 on postcard

Air Compressors

The compressors described in three new pieces of literature range in size from ½ to 100 hp and include both single and two-stage units. (Le Roi Div., Westinghouse Air Brake Co.)

For free copy circle No. 22 on postcard

Steam Traps

A six-page folder explains how a company's inverted open float steam trap works to remove condensate and keep steam lines hot and dry. Sizes range from ½ to 1-in. diam with working pressures from 1 to 300 lb saturated steam. (Crane Co.)

For free copy circle No. 23 on postcard

Battery Chargers

Seven models of metallic rectifier battery chargers help keep motorized hand-truck batteries at top efficiency. The line is described in a four-page bulletin. (General Electric Co.)

For free copy circle No. 24 on postcard

Industrial Rollers

Correct design can eliminate serious vibrations in rotating rolls by avoiding their critical speeds. It's the subject of a report which includes the mathematical formula for determining the first critical speed of a roll. (Rodney Hunt Machine Co.)

For free copy circle No. 25 on postcard

Grinding Machines

Describing 14 and 18-in. swing grinding machines is a 16-page catalog. These plain cylindrical units carry workpieces to 6500 lb. They come in 48 to 168-in. center lengths. (Landis Tool Co.)

For free copy circle No. 26 on postcard

Stainless Fasteners

Fasteners in a new 52-page catalog include 40 basic types (screws, bolts, nuts, etc.) in a variety of corrosion-resistant metals. A section covers stainless steels specifically. (Allmetal Screw Products Co., Inc.)

For free copy circle No. 27 on postcard

Tractor Parts

Preventive and operational maintenance of crawler type tractor parts are featured in a 6-page folder. And it tells how automatic welding units can keep tractors running. (The Sight Feed Generator Co.)

For free copy circle No. 28 on postcard

Muffle Furnace

Features of a standard rated gas-fired muffle furnace are analyzed in a 4-page bulletin. The furnace heat-treats and brazes special steels and nonferrous metals. (Surface Combustion Corp.)

For free copy circle No. 29 on postcard

High Fork Lift

An 8-page foldout describes a new triple stage upright for fork trucks. This device is a three-section, telescoping unit which raises high enough to permit ceiling-high stacking. It retracts low enough to fit through boxcar doors. (Clark Equipment Co.)

For free copy circle No. 30 on postcard

Welding Process

A company publication contains a resume of research on joining

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 11/21/57

Circle numbers for Free Technical Literature or Information on New Equipment:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70

If you want more details on products advertised in this issue fill in below:

Page ..... Product .....

Page ..... Product .....

Page ..... Product .....

PLEASE TYPE OR PRINT

Your Name .....

Title .....

Company .....

Co. Address .....

City ..... Zone .....

State .....

FIRST CLASS PERMIT No. 36 (Sec. 34.9 P.L.&R.) New York, N. Y.

BUSINESS REPLY CARD

No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE

Post Office Box 77

Village Station

NEW YORK 14, N. Y.

Dorson Screw Company

BUSINESS REPLY CARD

No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE

Post Office Box 77

Village Station

NEW YORK 14, N. Y.

FIRST CLASS PERMIT No. 36 (Sec. 34.9 P.L.&R.) New York, N. Y.

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 11/21/57

Circle numbers for Free Technical Literature or Information on New Equipment:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70

If you want more details on products advertised in this issue fill in below:

Page ..... Product .....

Page ..... Product .....

Page ..... Product .....

PLEASE TYPE OR PRINT

Your Name .....

Title .....

Company .....

Co. Address .....

City ..... Zone .....

State .....

FREE LITERATURE

90 - 10 cupro - nickel with E Cu A1-A2 by the inert-gas consumable electrode process. It also has items on hardfacing, welding aluminum bronze, etc. (Ampco Metal, Inc.)

For free copy circle No. 31 on postcard

Live Centers

Employing ball and roller bearings, new precision, frictionless live centers last about 10,000 working hours. Centers need oiling just once a year. A folder presents different types. (George Scherr Co., Inc.)

For free copy circle No. 32 on postcard

Stamping Presses

14-page brochure deals with 15 to 4000 - ton capacity automatic presses. These stamping units are of the inverted type with a crankshaft below the bed; this holds down vibration, allows higher speeds. (Brandes Press Co.)

For free copy circle No. 33 on postcard

Heat Exchangers

New impervious graphite shell and tube heat exchangers are announced in a catalog sheet. Sizes are: 8, 42 and 45-in. diam shells. This brings the maker's standard line to 16 units. Tube lengths run from 6 to 16 ft. (National Carbon Co.)

For free copy circle No. 34 on postcard

Plate Stretcher

Operations of an aluminum plate stretcher capable of a 16-million-lb pull are described in a technical booklet. In 32 pages, it reviews one plant's aluminum forming facilities for aircraft, ship hulls, atomic reactor parts, etc. (Reynolds Metals Co.)

For free copy circle No. 35 on postcard

Tube Straightening

How to straighten pipe and tube is told in a 24-page bulletin. It explains some problems and methods and tells how one maker's machines tackle straightening jobs. These units are of the new three-post design. The 24-page publication also includes several interesting case histories. (Mackintosh-Hemphill Div., E. W. Bliss Co.)

For free copy circle No. 36 on postcard

Punched-card Reader

A specification bulletin describes a new line of static punched card readers. It explains their uses in industrial processing and control systems. (The Peerless Electric Co.)

For free copy circle No. 37 on postcard

Lubrication Chart

A new 19-by-24-in. chart with exploded views of four types of valves includes a table of recommended lubricants for various services. (Rockwell Mfg. Co.)

For free copy circle No. 38 on postcard

Carbide Tool Inserts

A new insert with 10 cutting edges costs no more than a square insert with 8 edges. It's covered in a catalog on carbide tooling. (Willey's Carbide Tool Co.)

For free copy circle No. 39 on postcard

Steel Containers

A complete line of nestable, self-palletizing, compact - storing, and easily assembled steel shipping containers is the subject of a new four-page bulletin. (Ackermann Mfg. Co.)

For free copy circle No. 40 on postcard

Control Grinding

When large variations of stock have to be ground, a new control can speed the grinding cycle. It's described in a four-page bulletin. (Landis Tool Co.)

For free copy circle No. 41 on postcard

PreventiveMaintenance

As a guide to those using turret lathes, a new preventive maintenance chart helps eliminate production shutdown because of equipment failure. (Gisholt Machine Co.)

For free copy circle No. 42 on postcard

Dorson Screw Company sets high quality standards with KEYSTONE XL Wire

Talk to Chester S. Dorch, president and partner in Dorson Screw Company, 2509 West Cermak, Chicago, about cold heading with Keystone "XL" Wire—here's what he'll tell you:

"Our business reputation is based on ability to produce high quality sheet metal and machine screws as well as non-standard and highly specialized parts at a competitive price. Keystone "XL" Wire has been a major factor in helping us meet these standards."

An important reason why Dorson, like other progressive fastener manufacturers, has eliminated rejects, increased die life and has cut costs, comes from the *flowability* of Keystone "XL" Wire. This inherent characteristic of Keystone "XL" Wire makes it possible to produce extreme upset head fasteners of highest quality.

Keystone Steel & Wire Company, Peoria 7, Illinois

KEYSTONE

WIRE FOR INDUSTRY

Unique, as well as standard screws like those manufactured by Dorson and shown above, become high-speed production items when Keystone "XL" Wire is used. Your Keystone Wire Specialist, backed by a skilled metallurgical staff, will be pleased to assist you in solving your cold heading problems. He will show you how the uniform high quality of Keystone "XL" Wire costs no more—yet means much more in the long run.

Keystone Steel & Wire Company
Peoria 7, Illinois

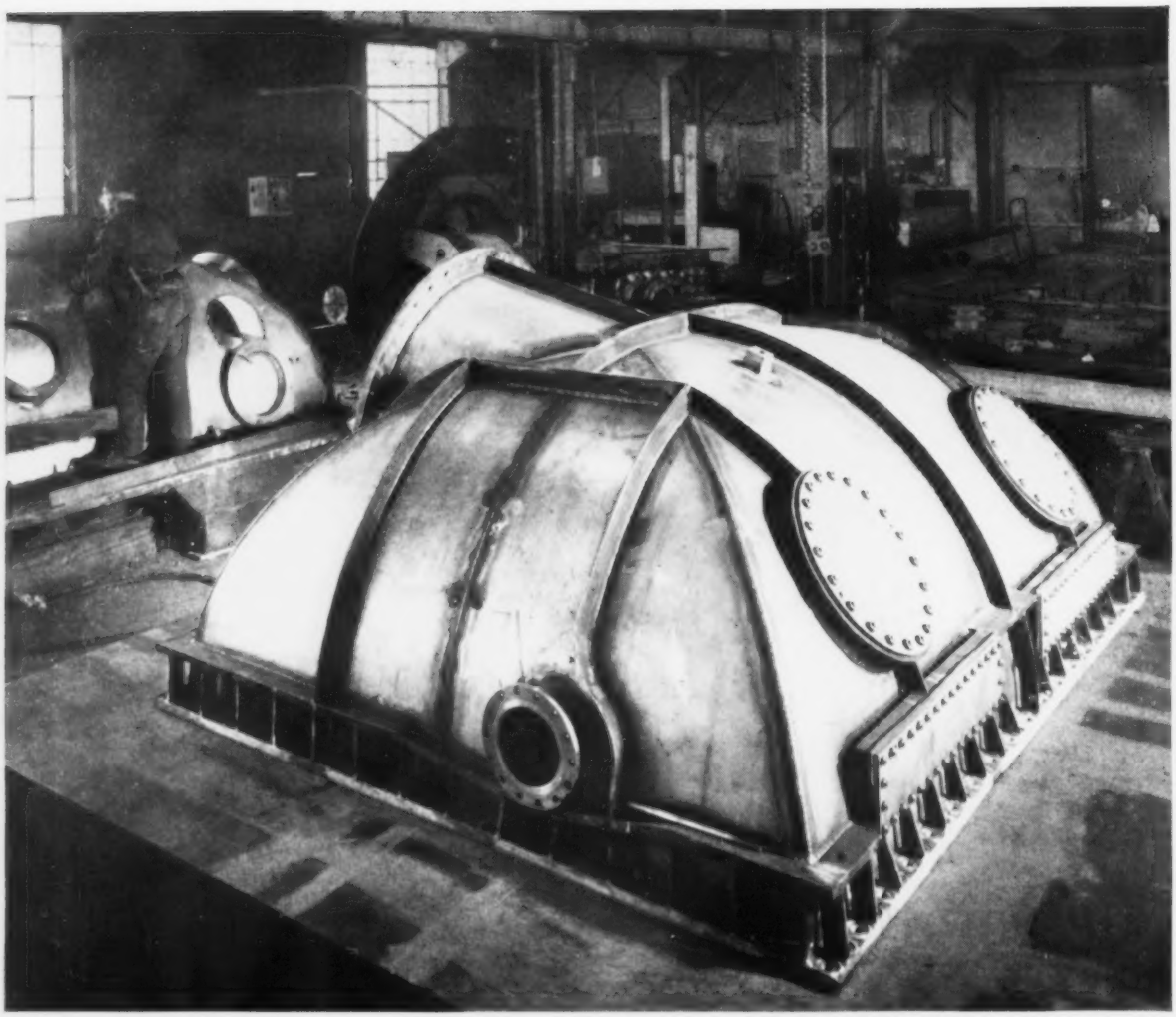
Brand New . . . COLD HEADING FACTS FOLDER . . . send coupon today! New folder discusses uses, applications, methods, technical facts, wire requirements.

Name_____ Title_____

Company_____

Street_____

City_____ State_____



Water boxes fabricated by welding ¼" sheet of Anaconda Cupro Nickel, 10%-755, in the plant of The Youngstown Welding and Engineering Co., Youngstown, Ohio. The flanges and ribs are of steel. This company also fabricates pipe and fittings of Cupro Nickel, 10%, for salt-water service.

Welded construction with Cupro Nickel sheet metal saves weight in water boxes for tough naval service

The marine condenser water boxes (shown above) were fabricated by welding Anaconda Cupro Nickel, 10%-755 sheet to save weight on an aircraft carrier. They do a job usually requiring heavy castings. And they can do it because Cupro Nickel, 10%-755 has the strength and resiliency to withstand surges of large volumes of water used in this service—combined with high resistance to corrosion by sea water, hot or cold. Cupro Nickel, 10%-755 can be welded with seams as strong as the parent metal.

This low-nickel alloy, originally developed in the laboratories of The American Brass Company for condenser tubes handling salt water, is rapidly finding many other uses in industry. Its unique combination of properties makes it highly desirable for the fabrication of high-temperature water heaters, for example, and in many types of pressure vessels.

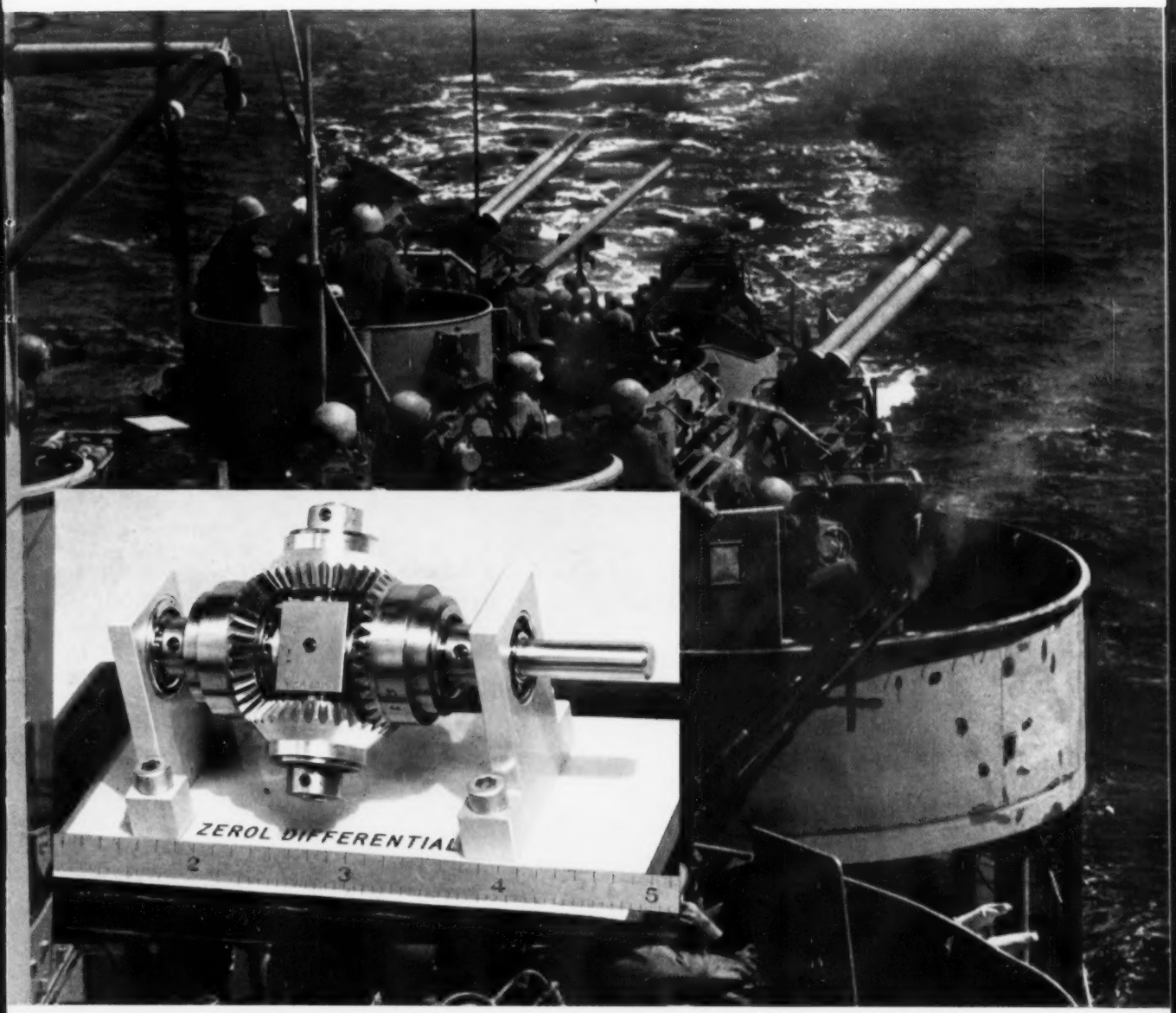
Wherever you need a combination of good weldability, high resistance to corrosion and high strength, consider Anaconda Cupro Nickel, 10%-755. Where even greater strength and corrosion-resistance are required, Anaconda Cupro Nickel, 30%-702 sheet, plate and tube are available.

TECHNICAL ASSISTANCE. Whatever your problem, the Technical Department of The American Brass Company will gladly help in the selection of the nonferrous alloy most practical for you. Write: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

ANACONDA®

COPPER AND COPPER ALLOYS

Made by The American Brass Company



Official United States Navy Photograph

When your fine pitch gears *must be accurate*

When you work with fine pitch gears like those in this naval fire control unit differential, tolerances are critical.

Tooth-to-tooth accuracy is extremely important to permit the guns to be sighted precisely on target.

So where accuracy is really critical in the gears you make, Gleason can help you three ways:

1. Machines that cut or grind any fine pitch gear

You can produce any fine pitch gear—spiral bevel, hypoid, Zerol®, or Coniflex®—exactly and economically with any of five Gleason machines.

Three automatic gear-cutting generators cover the entire field of cut fine pitch bevel gears up to $4\frac{1}{2}$" diameter. Two automatic, wet-type grinders are available for this same range of work and produce the ultimate in accuracy. All five work to your most rigid specifications.

2. Machines that test gears thoroughly

The Gleason No. 104 Hypoid Tester, for example, checks running qualities, tooth spacing, and concentricity of gears. It records test results on paper so that you have a permanent record of the total tooth-to-tooth composite error.

3. Engineering services

Gleason engineers are ready at all times to help you with any phase of the design and manufacture of fine pitch gears.

Simply write or phone for prompt assistance on any of your fine pitch gear requirements.

Send for these bulletins:

No. 2A Straight Bevel Coniflex® Generator
No. 103 Straight Bevel Coniflex® Generator
No. 2 Hypoid Generator
No. 105 Straight Bevel Coniflex® Grinder
No. 7 Hypoid Grinder
No. 104 Hypoid Tester

GLEASON WORKS

Builders of bevel gear machinery for over 90 years

1000 UNIVERSITY AVE., ROCHESTER 3, N. Y.

DO YOU EMPLOY 100 OR LESS?

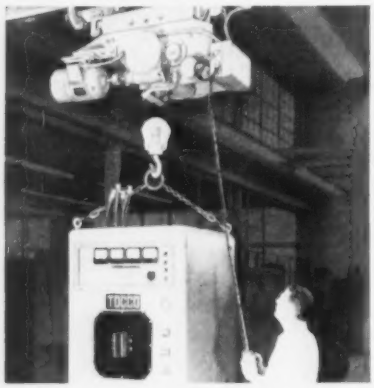
Management of smaller firms, experiencing growth potential and seeking to relocate or expand are considering Gardner, Massachusetts.

This away-from-target area, the economic and labor advantages, plus the new Gardner Program to attract growth firms is an expansion opportunity to be included in your program planning file.

If you do not know the Gardner Story, write, wire or phone:

Eugene McSweeney, Director

Gardner Industrial Foundation
Gardner, Massachusetts
Telephone Gardner 3775



Push a button for higher production with

READING ELECTRIC HOISTS

● Ohio Crankshaft's Tocco Division plant is meeting higher production goals with help from Reading Electric Hoists. The new plant was designed with a Reading Hoist "custom-built" into the plans. Write for our latest bulletin "The Why and How of Faster Production".

READING CRANE & HOIST CORP.

CHAIN HOISTS • OVERHEAD TRAVELING CRANES • ELECTRIC HOISTS

2101 ADAMS ST., READING, PA.

Seek New Methods To Work Columbium

As the use of gas turbine engines grows, so does the need for columbium. Producers foresee a considerable jump in demand of the metal and its alloys.

To meet this, two major firms are joining forces. They'll search for new and better ways to work the material.

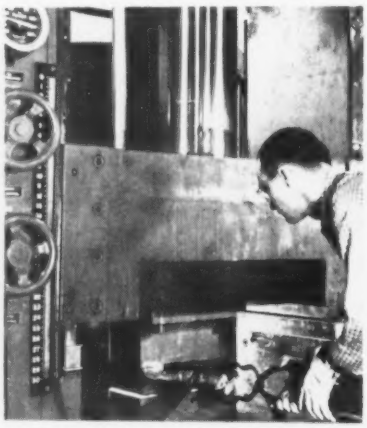
▪ To meet a forecast jump in the demand for columbium (niobium), researchers are looking for better ways to work it. Two large firms have currently joined forces to develop new forging methods for the metal and its alloys.

The companies, E. I. du Pont de Nemours, Wilmington, and Thompson Products, Inc., Cleveland, are particularly interested in the metal's use in gas turbine engines. In addition, du Pont is continuing application studies and technical work on ore reduction and refining processes.

Demand Growing—The demand for columbium and its alloys is growing rapidly, company experts say. They foresee a large increase in the use of gas turbine engines and a corresponding boost in use of the lightweight materials. Presently, gas turbines are used in jet and turboprop aircraft. Their extensive use in railway locomotive and marine engines, automobiles, and stationary power generators is expected.

Gas turbine engines are reaching the upper limits of operation based on the high-temperature properties now in use. This is roughly 1650°F. Pure columbium, though oxidizing rapidly at high temperatures, has extremely high strength at such elevated temperatures when alloyed. Alloying also boosts oxidation resistance considerably.

Resists Temperatures — Use of columbium alloys in such critical parts as turbine buckets — which operate at red heat—may lead to more efficient turbines, the firm believes. These might run at temperatures in the 2000 to 2200°F range.



Worker holds columbium billet as forge press forms it.

Since over-all performance of these engines is geared to the temperatures at which they can run, operation at higher heat would result in greater thrust per unit of

Want More Data?

You may secure additional information on any item briefed in this section by using the reply card on page 143. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

engine weight and increased thermodynamic efficiency per unit-weight of fuel.

Metal Is Ductile—In pure form, columbium is extremely ductile unless the common gases (nitrogen, hydrogen or oxygen) are introduced. Kept reasonably free of these gases, however, its workability is unusual. Du Pont metallurgists report that a 1-lb, ¾-in. ingot of columbium can be cold-rolled into foil 0.001-in. thick without annealing.

In addition to use in turbines, the materials may solve design problems in other fields. Its properties make it of potential value in jet engine burner tunnels, skins for suspersonic missiles, and in ramjet tail pipes. The metal has a low neutron cross-section which makes it useful in atomic reactors.

New Reactor Spurs Nuclear Research

A giant heat exchanger provides more than 12,000 gallons of cooling water every minute to a new nuclear research reactor at Oak Ridge, Tenn. The Trane Co., La Crosse, Wis., developed the eight-cell cooler that removes 68 million btu of heat per hour from the new reactor.

The fluid cooler is 178 ft long, 24½ ft wide and 14½ ft high. It has aluminum coils and eight 16 ft diam aluminum fans. In cooling the reactor water from 131°F to 120°F, enough heat is removed to heat more than 900 homes.

The 20 megawatt reactor gets the cooling water through underground pipes and then returns it to the heat exchanger for recooling.

New Research Tool—The new reactor will be used as a research tool in many fields of interest. One important part of this work will be tests on fluid fuels and engineering equipment proposed for use in future power reactors.

Another part of the program will investigate fundamental properties of matter. This project will make use of neutrons from the reactor in neutron diffraction experiments,

52100 · PETERSON · 52100
PETERSON · 52100 · PETER
00 · PETERSON · 52100 · PE
ERSON · 52100 · PETERSON
52100 · PETERSON · 52100
PETERSON · 52100 · PETER
00 · PETERSON · 52100 · PE
ERSON · 52100 · PETERSON
52100 · PETERSON · 52100
PETERSON · 52100 · PETER
00 · PETERSON · 52100 · PE
ERSON · 52100 · PETERSON
52100 · PETERSON · 52100
PETERSON · 52100 · PETER
00 · PETERSON · 52100 · PE
ERSON · 52100 · PETERSON
52100 · PETERSON · 52100
PETERSON · 52100 · PETER
00 · PETERSON · 52100 · PE
ERSON · 52100 · PETERSON

Looking for the world's most complete stock of 52100 steel tubes and bars? You've come to the right spot . . . . . .

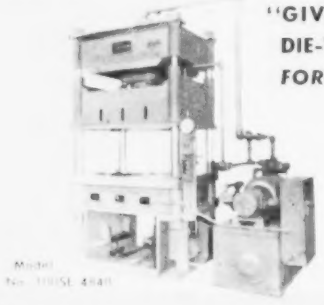
PETERSON STEELS, INC.
Union, New Jersey
Detroit, Michigan Chicago, Illinois

"TWO PRESSES IN ONE"

REPORTS STEWART-WARNER CORP., CHICAGO, ILL.

Die Cushion is automatically positioned

K. R. WILSON FOUR-COLUMN PRESS



"GIVES US PRECISION ACCURACY FOR DIE-TRYOUT . . . SPEED AND VERSATILITY FOR SHORT PRODUCTION RUNS."

The new K. R. Wilson Four-Column, Down Acting Press recently delivered to Stewart-Warner Corp. does "double duty" in their Chicago plant. The 100 ton capacity press features an automatically-positioned pneumatic die cushion. With the cushion in position, the press can be used both for die-tryout and for production runs utilizing forming or drawing dies. When the cushion is retracted, spring loaded dies can be used. With the air evacuated from the cushion, the press can be used for blanking. With such operational flexibility, and rapid conversion features, the K. R. Wilson Model No. 100SE-4840 Press can be kept in nearly continuous operation. Get all the facts now on this time-saving, money-making press.

SPECIFICATIONS:

DIE CUSHION Capacity—tons	22 6
DAYLIGHT — in./max.	24
RAM STROKE — in	18
RAM SPEEDS — in./min.:	
Approach	160
Pressing	29
Return	250
CONTROLS — Electric Push Button 20 H.P. UNIT	

HYDRAULICS DIVISION

K. R. WILSON, Inc.

OFFICES & FACTORIES — 208 MAIN ST., ARCADE, N. Y., U. S. A.

neutron time of flight experiments and fission fragment studies.

In this type of basic research work small but intense beams of neutrons are allowed to go outside the shield to the experimental equipment. In addition, many small samples will be placed inside the reactor core irradiation.

These "conventional" in-pile irradiations will investigate the effects of radiation on engineering materials; help study the properties of metals, alloys and ceramics; and enlighten knowledge about the production of radioisotopes.

Weighs Uncoupled, Moving Freight Cars

Railroad freight cars can now be weighed without stopping, switching or uncoupling them. And developers of the new system feel that it can increase the speed of rail shipments by 7.4 pct, adding the equivalent of 25,000 new railroad cars. Not only this, but they state that it can detect dangerous loading,

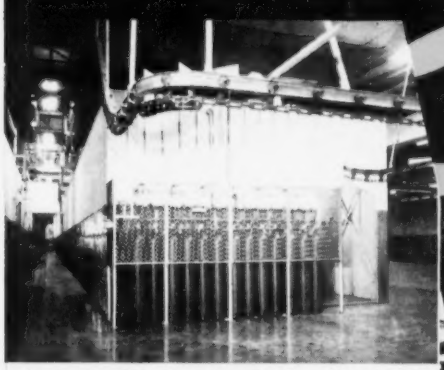
These special tracks break the bind between rail car couplers.

and increase the railroads' earnings in excess of a quarter of a billion dollars annually.

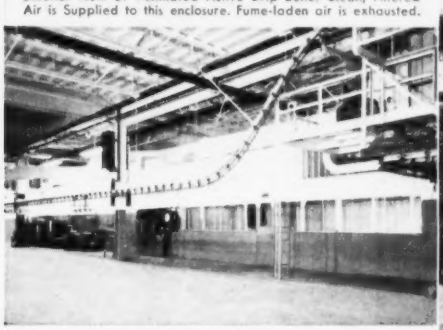
International Railroads' Weighing Corp., Indianapolis, developed the system with the cooperation of the Monon Railroad. According to the railroad, the weighing method, if successfully applied, "will un-

COMPLETE *Finishing* SYSTEMS

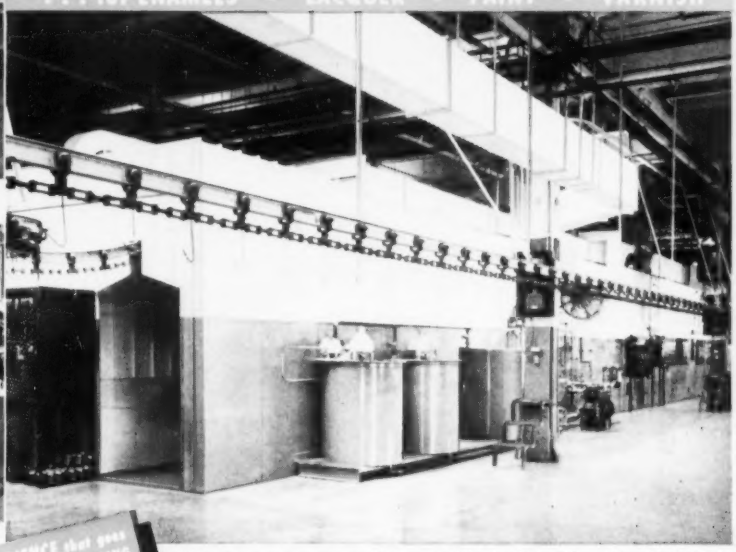
. . . for ENAMELS • LACQUER • PAINT • VARNISH



Exterior view of Ventilated Active Drip Zone. Clean, Filtered Air is Supplied to this enclosure. Fume-laden air is exhausted.

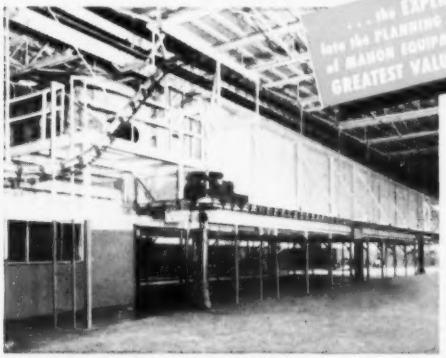


View showing glass in one side of Inactive Drip Zone where parts may be seen prior to entering Baking Oven.

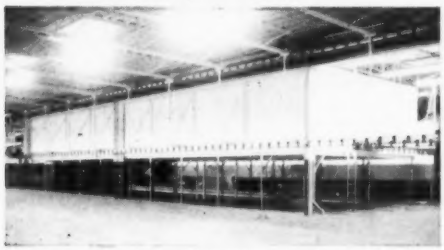


View of Mahon Flow-Coating Equipment at Chrysler Corporation of Canada, Limited. This is part of a Complete Mahon Finishing System for Coating Black Enamel Parts.

. . . the EXPERIENCE that goes into the PLANNING and ENGINEERING of MAHON EQUIPMENT is the item of GREATEST VALUE to YOU!



View of Mahon 450° Enamel Baking Oven. Oven is built against ceiling trusses to provide parts storage space below.



Another view of the Enamel Baking Oven. Finish is baked for 20 minutes at 450° in this 80 Ft. x 24 Ft. Mahon Oven.

Black Enamel Parts at CHRYSLER CORPORATION of CANADA, LIMITED, are FLOW-COATED in MAHON FINISHING SYSTEM!

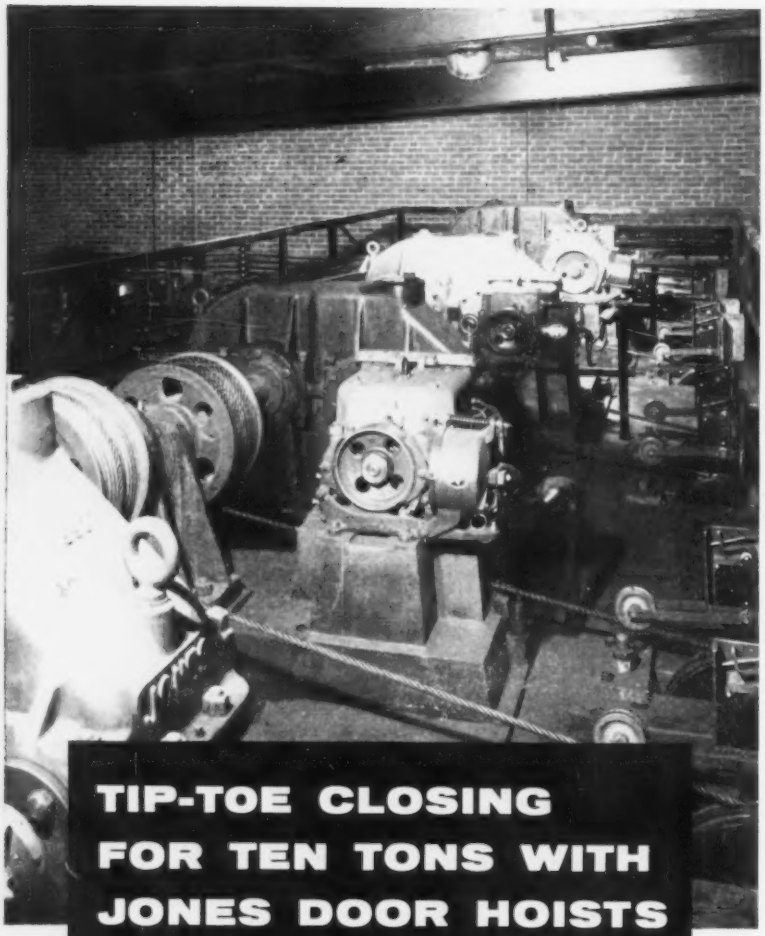
In addition to the body finishing system at the Windsor plant of Chrysler Corporation of Canada, Limited, Mahon also installed a complete finishing system for black enamel parts. This is a Flow-Coating System which includes a Mahon Flow-Coating Machine, a Ventilated Active Drip Zone, a Ventilated Inactive Drip Zone, and a 450° Finish Baking Oven with storage space below. Two Enamel Mixing Tanks and a Solvent Tank are provided outside the enclosure. The recirculating unit is equipped to automatically maintain the enamel at a specific temperature in the Flow-Coating Chamber. This is a typical Mahon Flow-Coating System, complete in every detail—automatic from start to stop. If you have a finishing problem, or are contemplating new finishing equipment, you will find that Mahon engineers are better qualified to advise you on both methods and equipment requirements . . . and better qualified to do the all-important planning and engineering of equipment—which is the key to fine finishes at minimum cost. Whether your job is to be Flow-Coated, Dip-Coated, or Spray Painted either Manually or by Electrostatic Process, you will find that Mahon equipment will serve you better, because it is engineered better and built better for more economical operation over a longer period of time. Mahon will do a complete job for you on one contract—undivided responsibility for the entire system insures proper coordination and safeguards you against complications which can upset your production schedules. See Mahon's Insert in Sweet's Plant Engineering File, or write for Catalog A-657.

THE R. C. MAHON COMPANY • Detroit 34, Michigan

SALES-ENGINEERING OFFICES in DETROIT, NEW YORK and CHICAGO

Engineers and Manufacturers of Complete Finishing Systems—including Metal Cleaning, Pickling, and Rust Proofing Equipment, Hydro-Filter Spray Booths, Dip and Flow Coaters, Filtered Air Supply Systems, Drying and Baking Ovens, Cooling Tunnels, Heat Treating and Quenching Equipment for Aluminum and Magnesium, and other Units of Special Production Equipment.

MAHON



More than five thousand Jones door hoists built in the last twenty-two years have operated doors weighing from a few hundred pounds to more than ten tons. These hoists were engineered for the job to operate from a few inches to many feet, at different time cycles, and with different time travels. Typical reports as a result of this custom engineering: zero impact for ten ton doors; low maintenance cost. The four double-drum hoists pictured here have been in continuous operation for over nineteen years without requiring replacement or repair parts.

Jones door hoists have been applied not only to operate furnace doors in the steel industry but to operate mill building doors, hinged valves, dampers, splash plates, and other equipment. To find out how H-R products and services can help you, consult your classified telephone directory for the nearest H-R representative, or contact Hewitt-Robins, Stamford, Connecticut.

HR HEWITT-ROBINS

POWER TRANSMISSION DRIVES . . . CONVEYOR BELTING AND IDLERS
INDUSTRIAL HOSE . . . VIBRATING CONVEYORS, SCREENS & SHAKEOUTS

loose a tremendous burden, which has handicapped the industry for many years."

How It Weighs—It weighs cars individually while the whole train runs over the scale. The key to the system is a set of specially designed rails at the approach to a standard scale which eliminates the bind between car couplers. Heretofore weighing cars while coupled and in motion has been impossible because of the transfer of weight between cars through the bound couplers which made one car weigh heavy while the other weighed light.

One installation in a classification yard's main incoming or outgoing track can automatically weigh every car passing through it. This does away with the costly and time-consuming process of switching every car which must be weighed to a separate weight track; uncoupling it; weighing it; and returning it to its proper classification track.

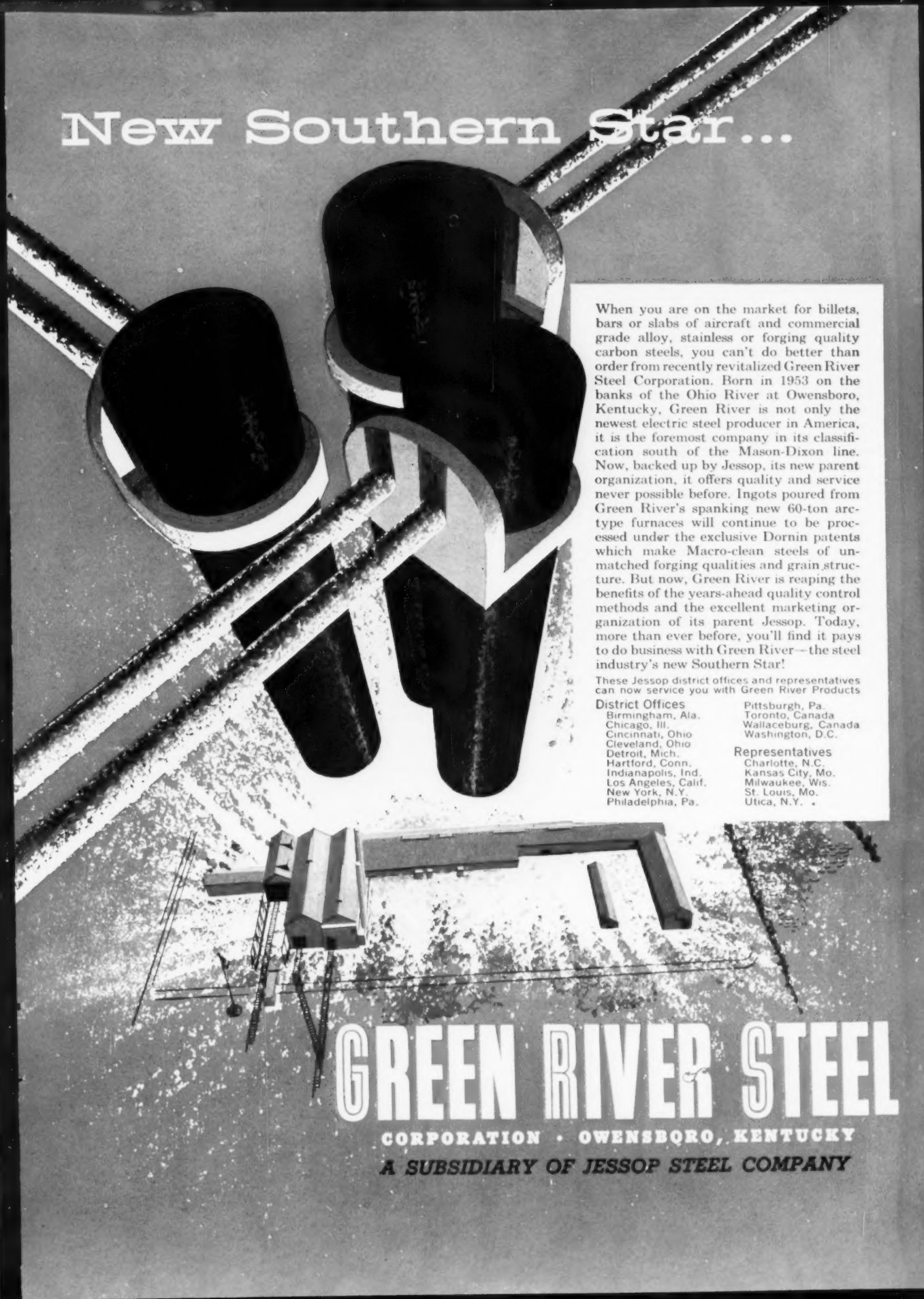
Any standard scale and recording device can be used. The test installation incorporates a Fairbanks Morse & Co. two draft scale and an automatic recorder manufactured by the Streeter Amet Corp., Grey's Lake, Ill.

Extra Drill Saves Time

Stationing a 15-in. drill press next to a multiple-spindle drilling machine performing a semi-automatic operation benefits Clark Equipment Co.'s Automotive Div., Jackson, Mich. It saves the operator's time ordinarily lost during the multiple-spindle operation.

Flanged hubs for automatic converter transmissions are drilled and chamfered simultaneously by one operator in the two-tool setup. He loads a flange on the drilling machine table and then presses the start button. The drilling machine drills the holes, retracts the drills and stops automatically.

No Lost Motion — During the



When you are on the market for billets, bars or slabs of aircraft and commercial grade alloy, stainless or forging quality carbon steels, you can't do better than order from recently revitalized Green River Steel Corporation. Born in 1953 on the banks of the Ohio River at Owensboro, Kentucky, Green River is not only the newest electric steel producer in America, it is the foremost company in its classification south of the Mason-Dixon line. Now, backed up by Jessop, its new parent organization, it offers quality and service never possible before. Ingots poured from Green River's spanking new 60-ton arc-type furnaces will continue to be processed under the exclusive Dornin patents which make Macro-clean steels of unmatched forging qualities and grain structure. But now, Green River is reaping the benefits of the years-ahead quality control methods and the excellent marketing organization of its parent Jessop. Today, more than ever before, you'll find it pays to do business with Green River—the steel industry's new Southern Star!

These Jessop district offices and representatives can now service you with Green River Products

District Offices

Birmingham, Ala.
Chicago, Ill.
Cincinnati, Ohio
Cleveland, Ohio
Detroit, Mich.
Hartford, Conn.
Indianapolis, Ind.
Los Angeles, Calif.
New York, N.Y.
Philadelphia, Pa.
Pittsburgh, Pa.
Toronto, Canada
Wallaceburg, Canada
Washington, D.C.

Representatives

Charlotte, N.C.
Kansas City, Mo.
Milwaukee, Wis.
St. Louis, Mo.
Utica, N.Y.

GREEN RIVER STEEL

CORPORATION · OWENSBORO, KENTUCKY

A SUBSIDIARY OF JESSOP STEEL COMPANY

Gas Fired, Oil Fired and Electrically Heated FURNACES

for these and other heat treating requirements

AGING
ANNEALING
ALUMINUM BRAZING
ALUMINIZING STRIP, ETC.
BILLET HEATING
BRASS BRAZING
BRIGHT ANNEALING
BRIGHT HARDENING
CARBON RESTORATION
CARBONITRIDING
CARBURIZING, GAS, ETC.
CONTROLLED ATMOSPHERE
COPPER BRAZING
ENAMELING
FORGING
GALVANIZING STRIP, ETC.
GLASS HEAT TREATING
HARDENING AND DRAWING
HOMOGENIZING
MALLEABLIZING
NITRIDING
NORMALIZING
SCALE-FREE HARDENING
SINTERING
SILVER SOLDERING
SPECIAL ATMOSPHERE TREATMENTS
SPHEROIDIZING
SOLUTION HEAT TREATING
STRIP COATING—ANY PROCESS
STRESS RELIEVING
QUENCHING

EF engineers specialize in designing and building production furnaces—continuous and batch types—including roller hearth, roller rail, chain belt, wire belt, slot and tube conveyor types, reciprocating, rotary, car, bell, pit and other designs; complete with special atmosphere producers, and time and labor saving material handling equipment as required.

Reflecting more than 40 years of continuous research and experience, and outstanding engineering accomplishments, EF furnaces combine high heating efficiency, accurate automatically controlled cycles, and advanced designs that minimize maintenance, assure economy of operation, high hourly output and uniformity of product.

Submit your production furnace problems to experienced engineers — it pays.

EF

BULLETIN No. 461

shows typical installations of EF Gas-fired, Oil-fired and Electric Furnaces.

Send for a copy today!

THE ELECTRIC FURNACE CO.

GAS FIRED OIL FIRED AND ELECTRIC FURNACES FOR ANY PROCESS, PRODUCT OR PRODUCTION *Salem - Ohio*

Canadian Associates • CANEFCO, LIMITED • Toronto 1, Canada

automatic cycle time the operator, who would ordinarily remain idle until drilling was completed, chamfers the holes of a previously drilled flange on the 15-in. Walker-Turner drill press. Combining the two operations practically cuts costs in half and eliminates extra handling between operations.

A number of drill presses are used in a similar manner throughout the plant. Their portability permits moving them into position for even very short runs. In addition to savings in direct labor costs, they also reduce costly machine time on larger equipment.

Press Brake Forms Unique Dome Sheets

Hydraulic press brakes form sections of aluminum dome auditorium material at Globe Iron Construction Co., Norfolk, Va. A sunburst pattern consisting of two series of radial creases on the surface of the sheet is impressed by each brake. Intersection of creases gives a con-

Hundreds of unusual sheets like these will form a building.

cave surface. A press brake then flanges the four edges.

Each aluminum sheet, 0.081-in. thick of 7 ft x 13 ft, is worked a total of 20 times for creasing and flanging. A 400-ton hydraulic press brake, manufactured by Pacific Industrial Mfg. Co., Oakland, Calif., has the size and versatility to handle

Call the waterboy, Princess Wenatchee! Chief Keokuk opened his book on making a hard, clean tackle . . . but it looks like first string Junior cut this lesson short!

Are those rough characters "Punk" Quality and "Bulgy" Costs running right over you? Tackle them now! Blow the whistle and send in triple-threat Keokuk Silvery Pig Iron to hold that line . . . it's used by leading foundries and steel plants. Pig for pig . . . car for car, its uniformity never varies. Handle by magnet, charge by weight or count the pigs for equal accuracy. Aluminum producers . . . you'll score every time with Keokuk Silicon Metal!

KEOKUK ELECTRO-METALS COMPANY
Keokuk, Iowa
Wenatchee Division, Wenatchee, Washington

When you think of SILICON, think of KEOKUK!

KEOKUK SILVERY PIG IRON

SILICON METAL - OTHER FERROALLOYS

Keokuk Silvery Pig is available in 60 and 30 lb. pigs and 12½ lb. piglets in standard analysis or alloyed to your specifications. Silicon metal and ferro-silicon are supplied in standard sizes and analyses.

SALES AGENT: MILLER AND COMPANY
332 S. Michigan Ave., Chicago 4, Illinois
3504 Carew Tower, Cincinnati 2, Ohio
8230 Forsyth Blvd., St. Louis 24, Missouri

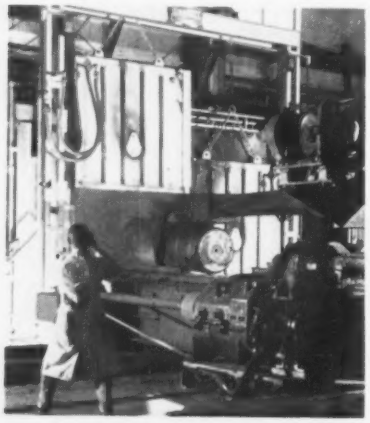
both the creasing and flanging operations.

The contract shop also uses the press brake for curving T1 high alloy steel in making vanes. A versatile unit, the machine tool handles many shapes and forms.

Custom-built Titanium Mill Begins Operation

A major facility devoted exclusively to rolling and forging titanium is shipping billets and large rounds to customers for civilian and military jet engine applications. Engineering work, meanwhile, continues on installation of sheet mills. These are scheduled to be in operation early next year.

Part of Titanium Metals Corp. of America, the Toronto plant will provide fully integrated facilities, from sponge through forgings, billets, and alloy sheet production. The firm is jointly owned by National Lead Co. and Allegheny Ludlum Steel Corp.



Metallurgist checks furnace temperature during billet removal.

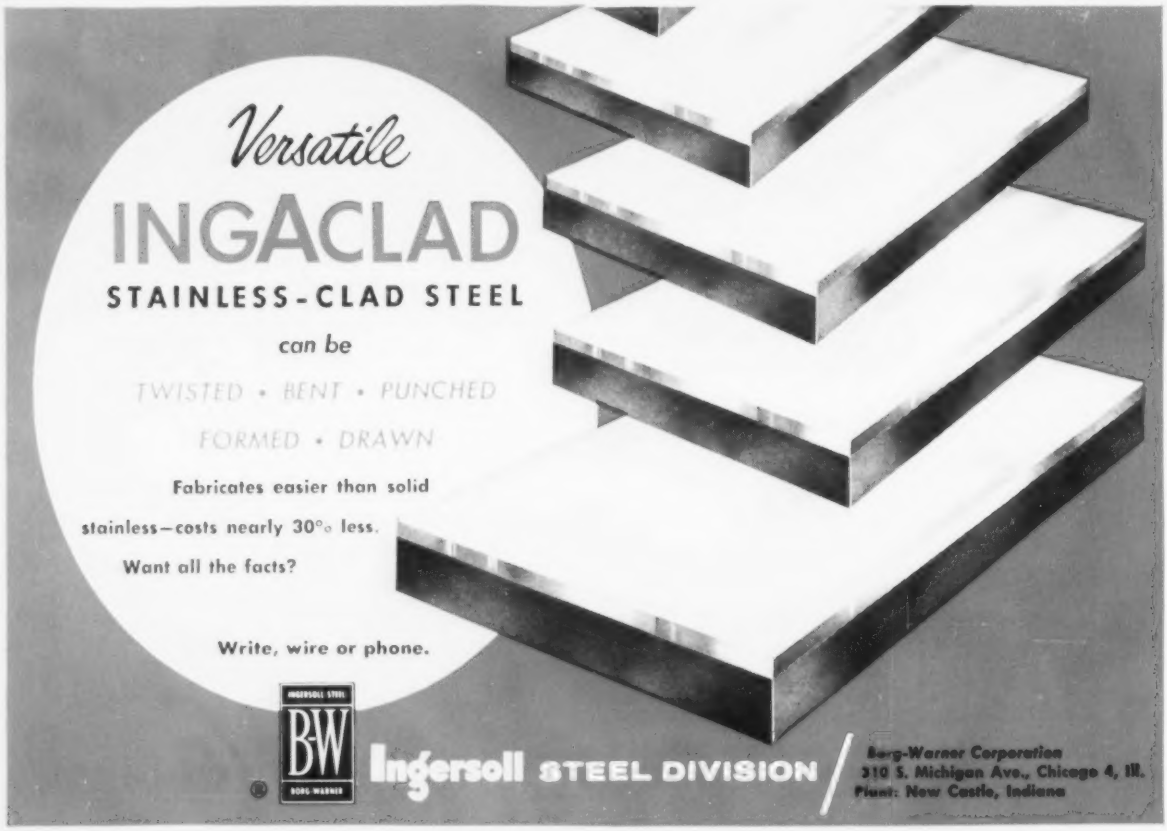
Special Setups — Highly instrumented equipment, specifically designed or modified solely for production of titanium is a key feature of the installation. Such equipment is expected to reduce metal loss—currently one of the more costly items in the overall production.

Ten percent of the employees at the plant have been assigned to safeguarding the quality of metal through laboratory inspection or as on-the-scene metallurgical observers. Complete laboratory facilities, equipped to perform the full run of mechanical tests required for titanium at both room and elevated temperatures, are in operation.

A product development group, established to translate research ideas into practical production methods, has also been located in Toronto. Laboratory facilities for this group are currently under construction.

High Cobalt Alloy Ups Product Life

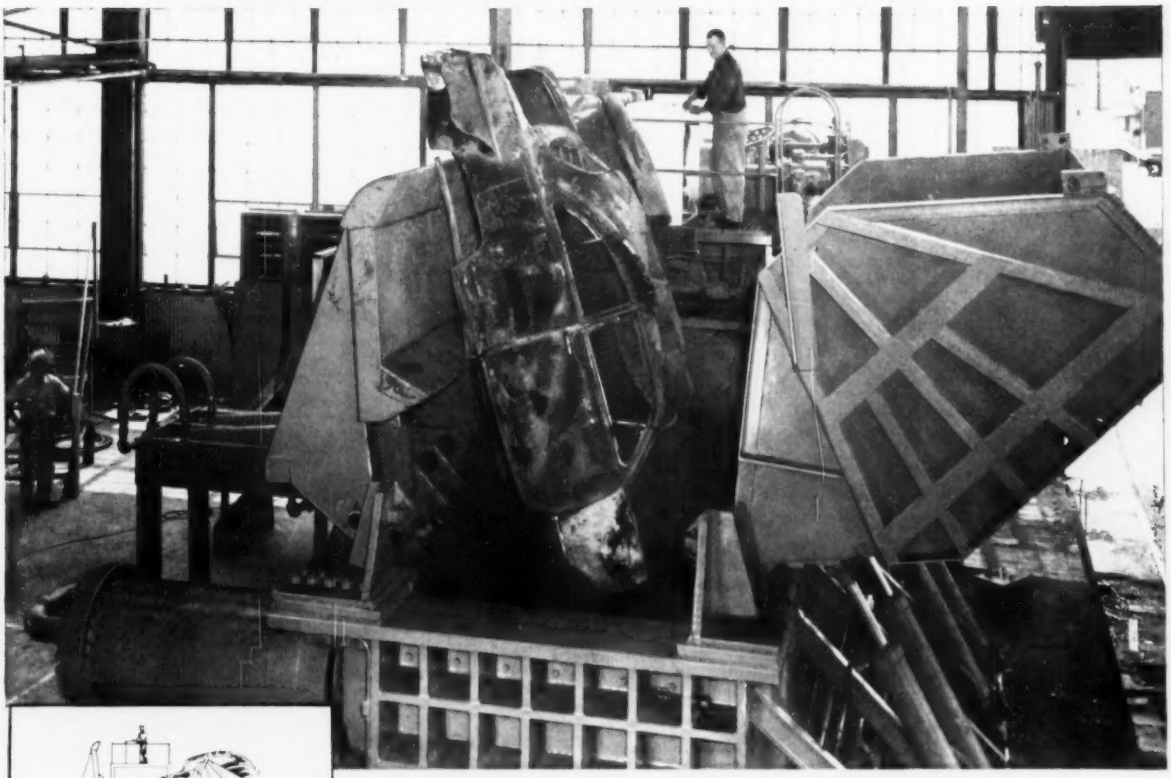
Using a high cobalt base alloy for torsion bands of precision balances eliminates a production operation

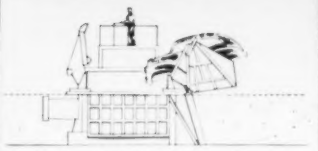


LOW INVESTMENT PRESS

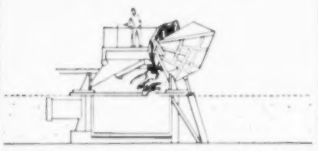
Bales Entire Car Body

WITHOUT CUTTING OR SHEARING WORK



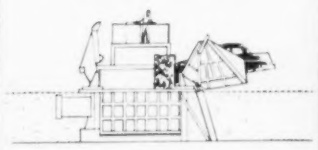


LOAD CAR ON SKIP PAN



CRUSH WITH COMPRESSION DOOR

PUSH IT INTO CHARGING BOX



BALE AND EJECT IT

Fast Pre-Baling Permits Users To Bale a Car Every 2 ½ Minutes

If 50% or more of your baling work is car bodies, the versatile Dempster-Balester 2000 was made for you. Its powerful Auxiliary Compression Door crushes the car body against the Skip Pan Loader and pushes it down into the charging box in a matter of seconds. This eliminates costly cutting-up, shearing and rehandling . . . boosts your production to big-press speeds with a medium size press investment.

Bale Size: 24″ x 24″ x 48″ (Approx.)
Bale Weight: 1500 to 2000 lbs.
Charging Box:
48″ d. x 72″ w. x 144″ l.

Controls: Push Button
Main Rams: Automatic Compression and Return
Mfg. by Dempster Brothers, Inc.

DEMPSTER BROTHERS, Knoxville 17, Tenn., Dept. IA-11

DEMPSTER BALESTER®

TO: Dempster Brothers Dept. IA-11
Knoxville 17, Tenn.

Please Send Complete Information & Literature on the Dempster-Balester 2000.

Name ..... Title .....
Company .....
Street .....
City ..... State .....

Your Local Warehouses are

Specialists in TOP QUALITY Cold Finished Steels

CARBON • ALLOY • LEADED

PATRONIZE YOUR LOCAL WAREHOUSES. THEIR STOCKS REFLECT AN OVERALL PATTERN OF SIZES AND GRADES ASSURING YOU AT ALL TIMES CONSTANT AND EFFICIENT SERVICE. THEY HAVE WHAT YOU WANT WHEN YOU WANT IT.

WYCKOFF

STEEL COMPANY

GENERAL OFFICES:
Gateway Center, Pittsburgh 30, Pa.

Branch Offices in Principal Cities

Works:
Ambridge, Pa., Chicago, Ill.,
Newark, N. J., Putnam, Conn.

STEEL CENTENNIAL 1857 1957

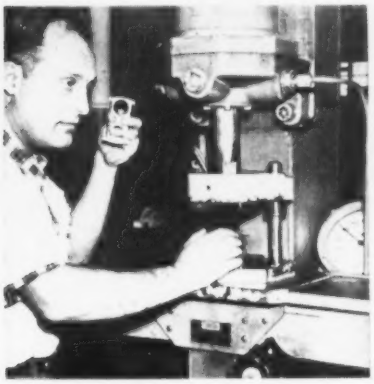
WYCKOFF STEEL PRODUCTS: Carbon, Alloy and Leaded Steels • Turned and Polished Shafting • Turned and Ground Shafting • Wide Flats up to 12" x 2" and 14" x 1¼" • All Types of Furnace Treated Steels

for one manufacturer. In addition, it improves the service life of the product.

The torsion bands are the most important elements in a balance; they are the only components affected mechanically in the operation of the balance. They absorb stress by twisting slightly in each swing of the balance bar.

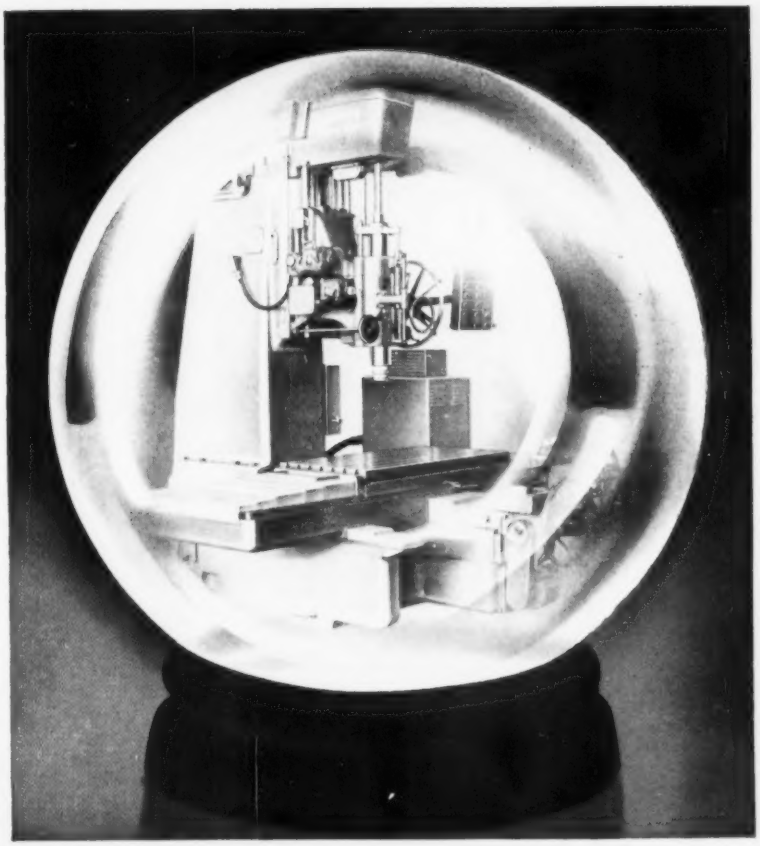
Uniformity Vital — Because the bands control sensitivity of the balance, they must maintain uniform tensile strength. When they are assembled on the trusses, the bands are uniformly stressed in a hydraulic press to approximately 100,000 psi by sound tuning against the 100,000 psi tone of a "master" truss.

Formerly the firm, Torsion Balance Co., Clifton, N. J., made the bands of high carbon steel. They were spray-painted after assembly to afford some protection from corrosion under the severe atmospheric conditions sometimes encountered. Prestressing a steel band brought it close to its yield strength; it reduced its ability to resist fatigue. Fatigue characteristics are important as bands are subject to load reversal in every swing of the balance.



Technician holds "master" truss as he tunes a truss in a press.

Alloy Needs No Paint—A product of Athenia Steel Co. Div., National-Standard Co., the alloy is a bright material with high corrosion resistance. It needn't be painted. Its fatigue characteristics, combined



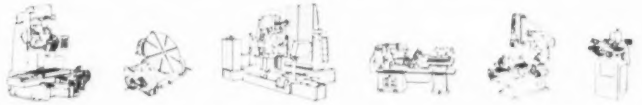
HOW TO FORECAST TOMORROW'S PROFITS

. . . AND MAKE THE FORECASTS COME TRUE WITH OUR EXTENDED PAYMENT PLAN!

You *don't* need a crystal ball for a look at tomorrow's profits. Just take an appraising look at your present machine tools and other plant equipment. The *only* way you can improve your competitive position and increase your profit margin is to reduce your production costs. If your present machines aren't up-to-the-minute . . . with everything it takes to produce faster, more efficiently and economically . . . you *can't* expect a bright profit future. To insure tomorrow's profits, you must invest *now* in the latest and finest.

The new Pratt & Whitney Extended Payment Plan makes it *easy* for you to replace immediately with new P&W Machine Tools. Your new profits will more than take care of the convenient installments that pay for the machines.

Write now for your copy of the booklet *"New Machines Make New Profits." Pratt & Whitney Company, Incorporated, 10 Charter Oak Boulevard, West Hartford, Conn.*



JIG BORERS • ROTARY TABLES • KELLER MACHINES • TOOLROOM LATHES • VERTICAL SHAPERS • CUTTER AND RADIUS GRINDERS

PRATT & WHITNEY

FIRST CHOICE FOR ACCURACY

MACHINE TOOLS • GAGES • CUTTING TOOLS

with high tensile (280,000-psi yield strength), give the balances using this alloy very long service life.

The balances are used by pharmacists and industrial laboratories.

Coating System Ends Re-handling

Applying synthetic finishes or lacquers to small metal parts via a new method does away with re-handling. The setup employs two units of equipment. One, a coater with rotating reels holds a variety of small parts by means of spring clips, wires, pegs, or tapered pins.

Finishing material flows from nozzles onto reel-mounted parts.

The other is a rotator to which reels are transferred after coating.

A product of William A. Finkbeiner, Cheltenham, Pa., fabricator of special equipment, the setup uses the same reel to handle the parts through all the stages of the finishing cycle. This reduces re-handling and reracking during coating and drying or baking. By using an appropriate number of reels, the coating process can operate on a continuous basis.

Uses Little Paint—The coater requires just three gallons of finishing material. This material is pumped from the bottom of the tank through a 25 micron filter and into a horizontal manifold. From here it cascades from a series of special bronze nozzles onto the reel-mounted parts as the reel is rotated slowly by hand. During this time the coating acts as a washing process to remove all lint, dust and other foreign particles from the parts, to produce a fine finish.

Approximately one minute in the closed coater provides a solvent-vapor run-out of excess lacquer which drains back to the reservoir for re-use.

Rotator Does Job—After coating, the reel and parts are transferred to the rotator. This accommodates eight reels at a time, each measuring 14-in. diam by 55-in. long. Revolving the reels on the rotator for about 15 minutes allows the coating to set with an even flow-out of any excess finishing material. Thus it eliminates runs, sags, orange peel, and dry areas.

When baking is required to cure the material, the reels are transferred to an oven conveyor or placed on a wheeled truck for rolling into a batch-type oven. Throughout all stages of finishing, parts need mounting only once.

Eliminates "Mess"—The coater-rotator finishing system is clean and simple. There's no need to clean a messy spray booth. The filter usually needs replacement only once a month. There is minimum loss of finishing material in this system, since there is no overspray and excess coating material drains back into the reservoir for re-use.

Both the Flowcoater and the Rotator employ explosion-proof motors, starters and conduit throughout.

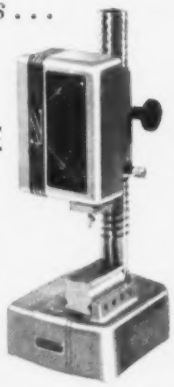
Discuss Metal Defects

A symposium on vacancies and other point defects in metals and alloys is being arranged by the Institute of Metals to be held at Harwell, England, on Dec. 9 and 10. The symposium will be open to non-members. Details are available from the Institute of Metals, 17 Belgrave Sq., London, S.W.1, England.

COMPARATORS

To Solve Your QUALITY CONTROL Problems . . .

INEXPENSIVE HIGH PRECISION



. . . for external gaging. P&W Sigmatic Comparators combine the simplicity of mechanical operation with magnifications to 5000X. Easily portable, require no outside power source.

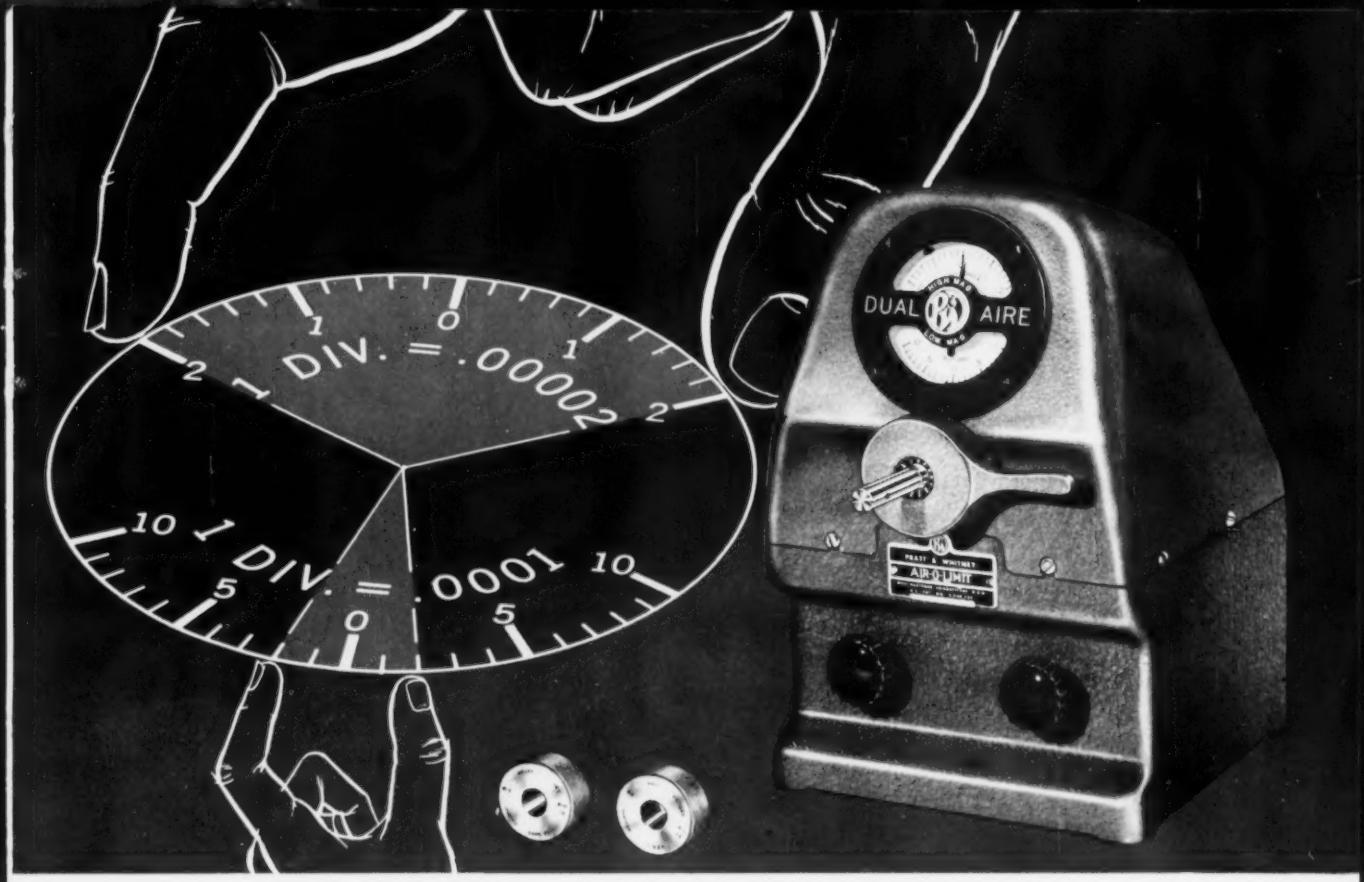
EXTREME VERSATILITY

. . . P&W *Air-O-Limit* Comparators are capable of checking a variety of internal and external dimensions. Readily engineered to meet *your* special requirements.

FOR THE ULTIMATE IN GAGING ACCURACY

. . . P&W *Electro-limit* Comparators combine mechanical gaging with electrical magnifications up to 110,000X. Errors in "tenths" and "hundredths" are read easily, accurately.

PRATT & WHITNEY



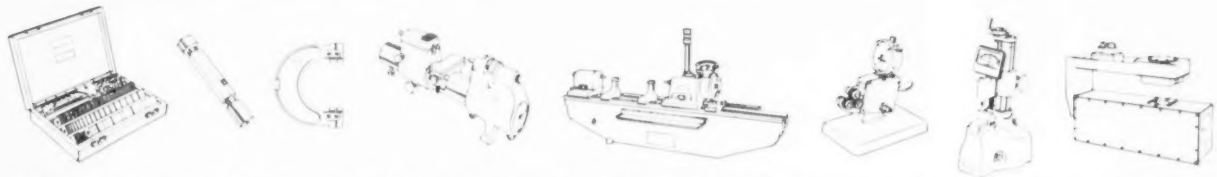
A NEW Concept in SIZE CONTROL . . .

THE PRATT & WHITNEY DUAL-AIRE AIR-O-LIMIT COMPARATOR

. . . provides two separate magnifications simultaneously without switch-over. Designed for use *at the machine* on precision grinding, honing or lapping operations where tolerances must be held to millionths, it insures more dependable size control and effectively reduces work spoilage. During preliminary work stages, the machine operator uses the low-magnification scale . . . reading deviations from finished size in .0001" increments. As finished size is approached, the operator reads the high-magnification scale . . . easily and accurately noting size deviations in twenty-millionth increments.

A FREE In-Plant Demonstration

. . . on your own high-precision finishing operations will *prove* how the P&W Dual-Aire can improve your quality control. Now is the time to request your free demonstration; there's no obligation, of course. Pratt & Whitney Company, Inc., 10 Charter Oak Blvd., West Hartford 1, Conn.



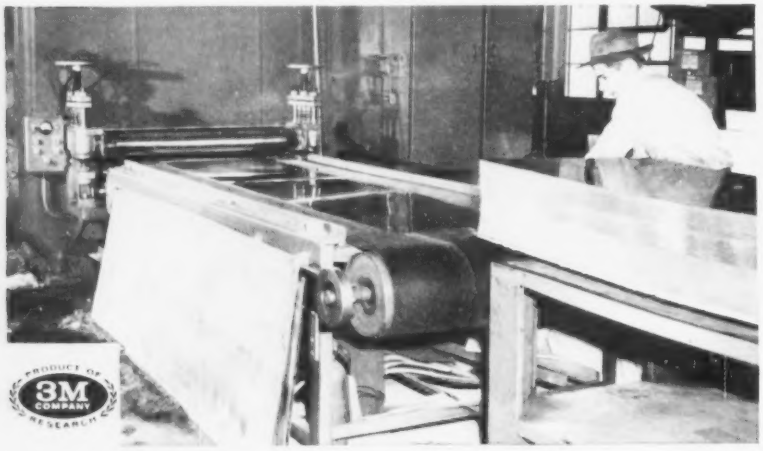
GAGE BLOCKS · CONVENTIONAL GAGES · SUPERMICROMETERS · STANDARD MEASURING MACHINES · COMPARATORS · AUTOMATION AND CONTINUOUS GAGES

PRATT & WHITNEY

FIRST CHOICE FOR ACCURACY

MACHINE TOOLS • GAGES • CUTTING TOOLS

PROBLEM: Victory Metal Mfg. Corp., maker of commercial refrigerators, uses coated abrasive belts to surface-polish 18-8 stainless steel sheet stock from its standard 2B mill finish to a #4 finish. With Brand "X" Belts, costs per polished sheet were high.



ANSWER A 3M Representative suggested that this Plymouth Meeting, Pa., firm switch to 3M Abrasive Belts — Grit #80 Three-M-ite Cloth for rough grinding, Grit #150 Tri-M-ite Resinite Cloth for polishing. Cost per sheet for polishing operations immediately dropped substantially, with superior finishes!

Your 3M Representative can help *you* cut costs and increase production, too. Call him today. Or write Minnesota Mining and Manufacturing Co., Dept. DD-117, St. Paul 6, Minn., for FREE booklet: "Case History Reports on 3M Abrasive Belts."

Made in U.S.A. by Minnesota Mining and Mfg. Co. General Offices: St. Paul 6, Minn. In Canada: P.O. Box 757, London, Ontario. Export Sales Office: 99 Park Avenue, New York City. Makers of "Scotch" Brand Pressure-Sensitive Tapes, "Scotch" Brand Magnetic Tape, "3M" Adhesives, "Underseal" Rubberized Coating, "Scotchlite" Reflective Sheeting, "Safety-Walk" Non-slip surfacing.

Blend Dry, Pulverized Materials Accurately

A new concept in the blending of dry bulk pulverized materials reduces deviations in unblended components down to ±0.2 pct. Basically an aeration system, it will blend any materials which can be fluidized by compressed air. These would include cement, fly ash, and other materials with similar physical characteristics.

Capable of blending materials with different bulk densities and finenesses, the system was developed by the Fuller Co., Catasauqua, Pa. It works at high tonnage capacity to reduce manhours of labor per ton and cut power consumption, as well.

How It Works — The quadrant blending method makes use of a round silo with a substantially flat bottom. This silo bottom is covered with aeration units which are the heart of the system. They are closely placed to give uniform distribution of air and are faced with a porous refractory block to release the air in innumerable fine jets.

Compressed air is applied in pulsations to one quarter section of the silo bottom at a time. Air volume is sufficient to fluidize the dry pulverized material above that individual section.

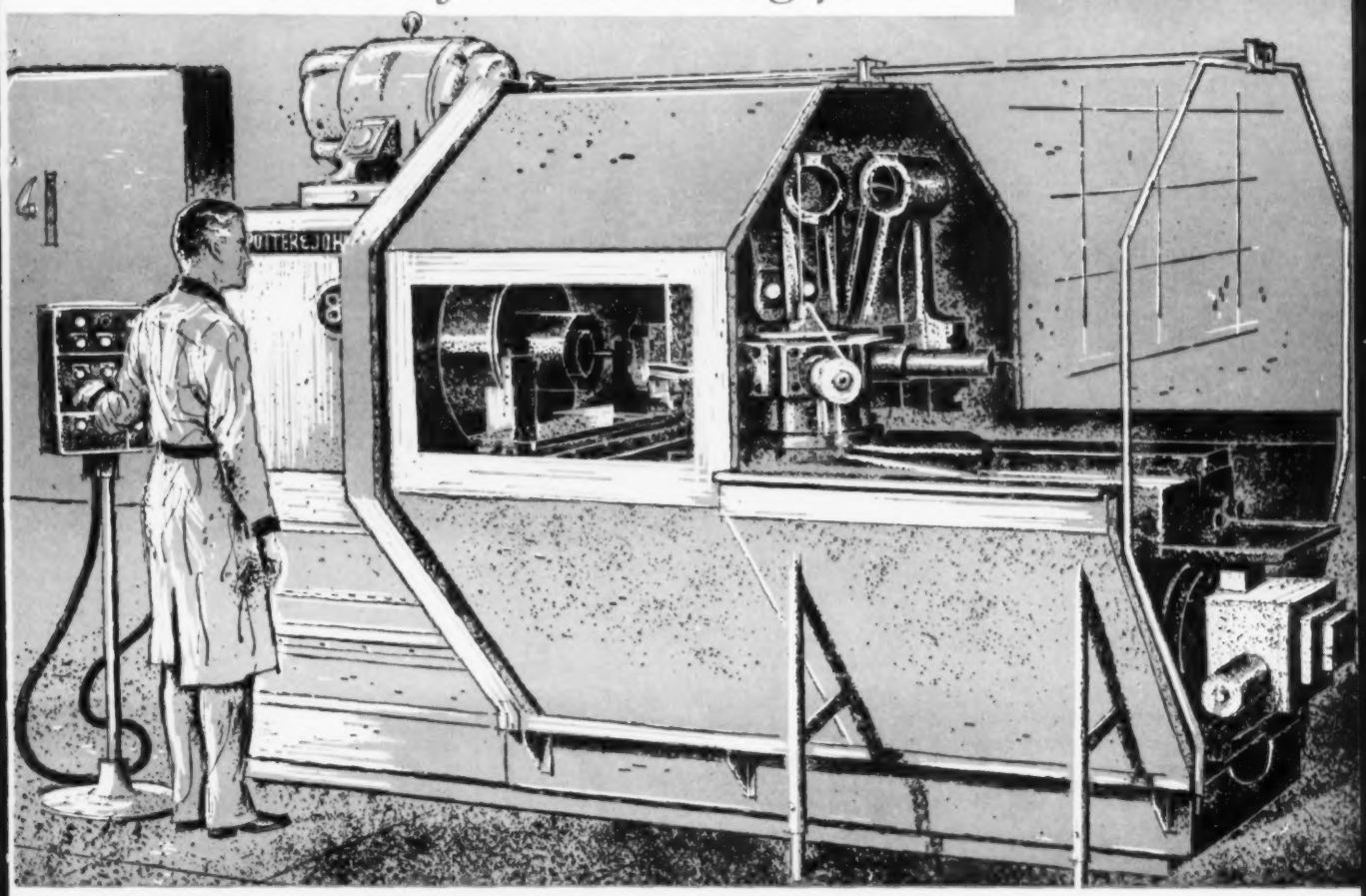
As material is simultaneously expanded and fluidized, it rises above the level of the adjacent three quadrants and flows out across them at a rapid rate. Runoff is at a slope of two to five degrees.

Meanwhile—At the bottoms of the temporarily inactive quadrants, a small amount of compressed air is released—enough to make the material mushy but without basic change from its unaerated density.

The rising column of expanded material in the active becomes partly surrounded with heavier material which tends to slump over into the active quadrant. Here it

PRATT & WHITNEY

*Here it is . . . . the machine industry's been asking for !**



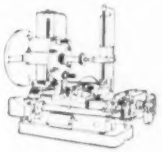
THE NEW P&J 8-U

AUTOMATIC Turret Lathe

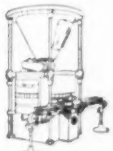
***A MACHINE TO FILL THE GAP BETWEEN OUR 6 DREL-40 AND 10-U**

Here is a new automatic with the extra power, rigidity and capacity you may be looking for. It's designed and engineered to handle your really big, hard-to-machine jobs faster, better and more economically than ever before. It will hog out tough alloys in a hurry, hold close tolerances and produce fine finishes with speed and efficiency. The 8-U with 50 hp, 30″ chuck and 40″ swing is intermediate in size between our 6 DREL-40 and 10-U. Take a minute now to write for specification circular and see how the new P&J 8-U fits into your production schedules.
Potter & Johnston Company, Pawtucket, Rhode Island.

AUTOMATIC TURRET LATHES



GEAR CUTTERS



GILDA PACKAGING MACHINES

POTTER & JOHNSTON

SUBSIDIARY OF PRATT & WHITNEY COMPANY, INC.

PRECISION PRODUCTION TOOLING SINCE 1898

TECHNICAL BRIEFS

becomes aerated, expands, rises and flows outward. The resulting strong and continuous roll-over motion in a vertical circuit produces an intensive and thorough mixing.

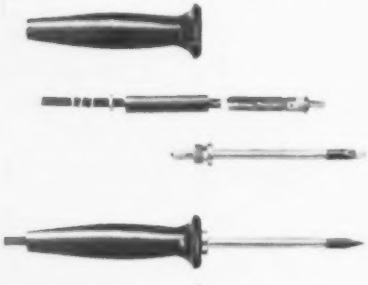
Aeration is periodically switched (each 5 to 15 minutes, depending on material) from quadrant to quadrant in rotation. After one full circuit of the silo bottom all of the material has been put into motion. Two such circuits will generally result in completely blended material.

Use It Two Ways—The Airmerge System is suited for either batch or continuous operation. One silo may be used to accumulate and blend a batch which is subsequently fed out to the process. However, for continuous processing, two or more silos are used; one feeds the process while a batch is accumulated and blended in the other.

Another scheme is to fill a silo and withdraw from it continuously, simultaneously maintaining the material level with a steady inflow of unblended material at the same rate that blended mix is being withdrawn.

Tube Aids Soldering

Low conductivity of Type 430 ferritic type stainless tubing cuts down the amount of heat carried



Disassembled soldering iron shows where tubing is used.

from the tip of one maker's soldering iron to its handle. The tubing, welded material measuring 21/64-in. OD by 0.017-in. wall thickness, sheathes the shank of the iron between the copper tip and the handle. Irons of this type are used extensively in the manufacture of electrical and electronic equipment, switchboards, meters, and a wide range of instrumentation. Carpenter Steel Co., Alloy Tube Div., Union, N. J., supplies the tubing.

Molten Slag's Heat Doesn't Harm Panes

What type of windows remain undamaged when situated over a white-hot 2662°F molten slag pool? This posed a continuing problem for Hooker Electrochemical Co., Niagara Falls, N. Y.

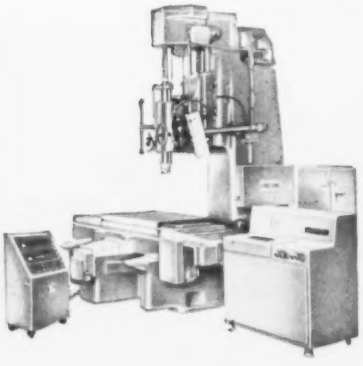
The company found the answer in one of its own products. This is a fire-retardant, glass fiber reinforced polyester resin. Plastic fabricators supply it in light-transmitting panel form.

Fractures Glass—Years ago, the company, which has produced phosphorus by the electric furnace process since 1897, tried high-strength window glass for this purpose. However, the exceptionally high temperature of the molten phosphorus slag, which pours periodically from the building whenever a furnace is tapped, made the glass fracture at the first tapping, even though reduced to 200 to 300°F by the time it reaches the windows.

Shattered glass then would periodically fall out or blow in, presenting a hazard to those below. Remaining glass quickly became discolored by fumes and etched by fluorine in the phosphoric acid formed in the rising phosphorus pentoxide gases. These are, however, harmless to individuals.

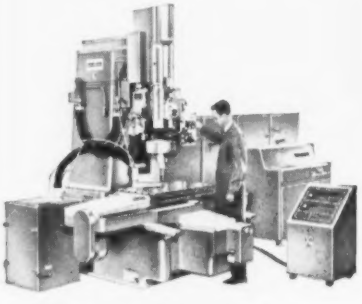
Shutters Do Job — Accordingly, shutters of sheet tin were used for many years. These opened to permit entrance of air and light, provided a furnace was not being tapped at the time, and if smoke conditions in the furnace room became intolerable. They had the disadvantage, however, that open shutters chilled the room on cold winter days. In addi-

PRATT & WHITNEY
NUMERICAL CONTROL
APPLICATIONS



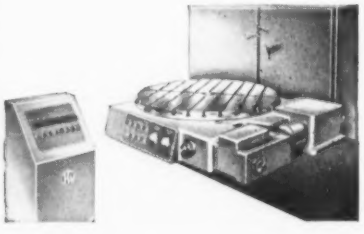
ELECTROLIMIT JIG BORER

Equipped with Numerical Control, the P&W No. 2E Jig Borer is equally suitable for toolroom and precision production applications. Settings accurate to .0001" are made automatically from data supplied by a punched tape or an operator's keyboard.



VERTICAL PRECISION HOLE GRINDER

Table and carriage are similar in design to the No. 2E Jig Borer and the same ultra-precision Electrolimit Measuring System is employed. Column, however, is equipped with interchangeable, turbine-driven grinding heads for spindle speeds to 100,000 rpm.



PRECISION ROTARY TABLES

These Pratt & Whitney Rotary Tables are the ultimate in precision and convenience for circular spacing, graduating and angular positioning. Settings accurate to 5 seconds of arc (2 seconds for repetitive settings) are made automatically from data supplied by punched tape or operator's keyboard.

PRATT & WHITNEY

TO "TENTHS" IN SECONDS

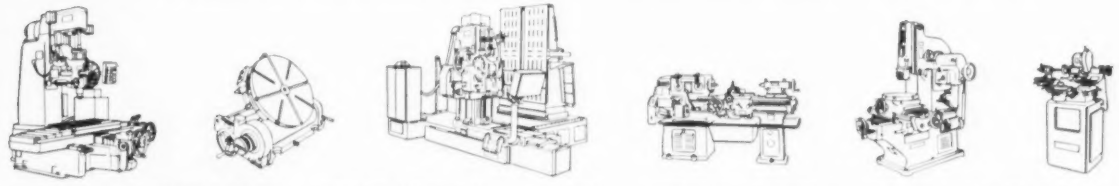
. . . and no mistakes!

WITH NEW PRATT & WHITNEY NUMERICAL CONTROL

Operating under Numerical Control, this P&W Precision Hole Grinder is positioned and re-positioned — accurate to .0001" — in an average of only 14 seconds! And since settings are controlled by a punched tape, the chance of work spoilage through operator error in reading blueprint data or setting dials is eliminated. The operator is free to concentrate his attention on work quality.

Applied to Pratt & Whitney Jig Borers, Precision Hole Grinders, Rotary Tables and special machines, Numerical Control not only speeds up toolroom operations, but also makes the high precision of these machines available for efficient short- or long-run production work. In this type work, time savings up to 40% over manual operation are realized. Compare the performance of your present manually-controlled machines with the new standards of speed, accuracy and economy being established by numerically-controlled P&W equipment. If they don't measure up, you are missing important opportunities for improved work quality, larger savings and greater profits.

Write now for complete information.
Pratt & Whitney Company, Incorporated,
10 Charter Oak Boulevard, West Hartford, Conn.



JIG BORERS . . . ROTARY TABLES . . . KELLER MACHINES . . . LATHES . . . VERTICAL SHAPERS . . . CUTTER AND RADIUS GRINDERS

PRATT & WHITNEY

FIRST CHOICE FOR ACCURACY

MACHINE TOOLS • GAGES • CUTTING TOOLS

tion, the interior was gloomy when using the entirely artificial light required much of the time. Employees' morale suffered in consequence. The phosphorus furnace building was relatively low on the list of places in the plant where people wanted to work.

Material Changes This—Then an alert corrosion engineer suggested that plastic panels made of glass fiber - reinforced polyester replace the sheet tin. These do not support combustion even when a blowtorch is applied at close range. And panels of such material have both Underwriters' listing and Factory Mutual Insurance approval.

Last spring ⅛-in. thick, green-tinted plastic panels, produced by Resolite Corp., Zelionople, Pa., were inserted for testing in various window locations subject to differing temperatures on the critical side of the building. The corrosion engineer's recent check manifested perfect performance at all locations with no physical change occurring since installation. They have, of course, already far outlasted the glass window panes once used.

WISSCO
PERFORATED METALS
in every popular
design and material

Rounds, squares, slots and decorative perforations . . . you'll find they're all available from Wissco. Wissco's large selection of Perforated Metals come in stainless and carbon steels, monel, copper, brass, bronze and aluminum.

Many popular styles are available from large stocks. Wissco also perforates to your specifications. To find out all about this Wissco custom perforating service, contact our nearest sales office.

In the East
WICKWIRE SPENCER STEEL DIVISION
Atlanta • Boston • Buffalo • Chicago
Detroit • New Orleans • New York
Philadelphia

In the West
THE COLORADO FUEL AND IRON CORPORATION—
Denver and Oakland

5331

WISSCO
CF&I PERFORATED METALS
PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

Automatic X-ray Gage Checks Foil Thickness

An automatic X-ray gage directs the rolling of aluminum foil at speeds up to 3000 fpm at the Permanente, Calif., plant of Kaiser Aluminum and Chemical Corp.

The X-ray gage continuously monitors foil thickness as it is rolled and provides a corrective signal to aid in maintaining close tolerances. The gage will measure foil up to 0.015 in. thick with an accuracy of about one per cent.

Speed Affects Gage—The control system, manufactured by General Electric's Industry Control Dept., Roanoke, Va., is designed to take advantage of the fact that rolling mill speed directly affects foil thickness.

Engineers claim the gage virtually eliminates errors due either to changing temperatures or the thickness of oil film on the foil surface. These two factors disturbed the accuracy of previous gage types.

Small electrical signals from the deviation circuit of the X-ray gage are amplified in a multi-stage magnetic amplifier. This unit steps up the power level of the signal sufficiently to produce an output which varies the main motor field, and therefore, the motor speed.

Warning lights indicate when the automatic control is nearing the limit of its operating range, thereby alerting the operator to bring the mill back into range by manual adjustment of screws, reel tension, or mill speed.

Kaiser officials report that the control has progressively narrowed gage variations. It has been especially effective in the medium and light gages, improving yield materially.

MACHINE TOOLS · GAGES · CUTTING TOOLS

Ample and diverse stock of ingots made of ALCO steel is maintained at Latrobe, Pa. plant

INTEGRATED PRODUCTION ASSURES TOP QUALITY IN ALCO FORGED FLANGES

ALCO meets flange needs with production of steel in any carbon, alloy or stainless grade; you get flanges that are uniform in metallurgy, forging and finishing

Every step of ALCO flange production is given careful attention, from charging the open hearths to final inspection and test. This complete integrated control is important to you because it results in uniformity that saves you money in welding, preheat and postheat operations. It means faster delivery of flanges, too.

Production of top-quality flanges at ALCO incorporates the most modern steelmaking, forging and rolling techniques. Strict quality control checks are made at every stage to insure exact conformance to specifications.

ALCO flanges are available in standard sizes and types from 18-in. OD to 145-in. OD. Stocks are maintained in Latrobe, Pa. and Beaumont, Texas. "Specials" are produced on order and quickly. Your nearest ALCO representative can give you complete information – or write today for our catalog. Spring & Forge Division, Dept. FL-2, P.O. Box 1065, Schenectady 1, N. Y.

ALCO

ALCO PRODUCTS, INC.

NEW YORK

Sales Offices in Principal Cities

Locomotives · Diesel Engines · Nuclear Reactors · Springs · Steel Pipe · Forgings · Oil-Field Equipment

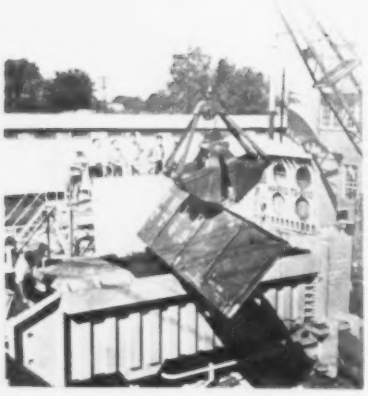
New Production Ideas

Equipment, Methods and Services

Borer Performs Toolroom, Production Jobs

Versatility is this precision boring machine's key feature. Designed for universal use, the machine adapts to production, semi-production or toolroom jobs with equal efficiency. It employs special vertical and horizontal slides. For handling a wide variety of workpieces, the vertical spindle adjusts 2 in. between 9 and 11 in. from the spindle centerline to the table. Along with a 4 in. horizontal adjustment, this permits an infinite number of boring tool positions. The bridges can be spaced relatively wide apart for medium size workpieces or close together for smaller work. Both ends of the machine may be operated in the same setup, or worked individually in separate setups. A standard long stroke hydraulic cylinder affords 6 in. of extra table travel, providing a total of 18 in. Two-speed motors belt-drive the spindles through a range of single-sheave or multiple step pulleys. (Ex-Cell-O Corp.)

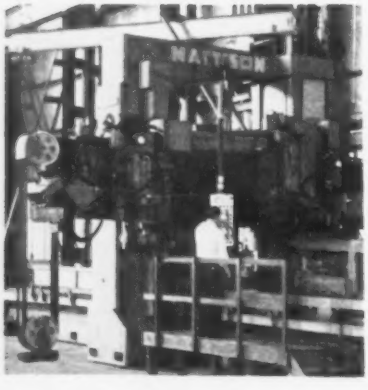
For more data circle No. 50 on postcard, p. 143



Big Shear Tackles Heavy-duty Scrap Items

Equipped with automatic controls for continuous operation, a new line of shears quickly, effortlessly slices scrap to preselected lengths. The largest model easily handles such items as steel pipe, heavy structurals, reinforcing bars, heavy channels and railroad scrap (i.e., car siding, bolsters, center sills). These needn't be cut with an acetylene torch, of course. The unit also takes complete automobile frames, including front and rear axles. The firm makes three major models of shears: (1) a small unit producing to 30 tons of prepared scrap per day; (2) a "workhorse" model handling any bulky charge from 800 to 1200 lb at rates to 12 tons per hour; and (3) a heavy-duty machine ejecting 2400 lb high-density bales measuring 24 x 24 x 60 in. (Harris Foundry & Machine Co.)

For more data circle No. 51 on postcard, p. 143

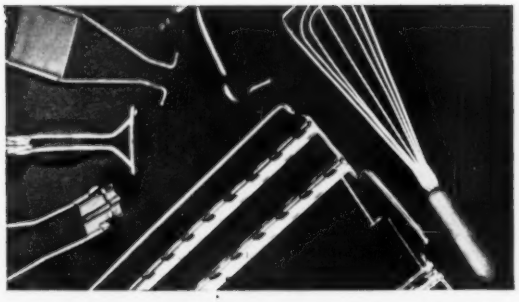


Big Surface Grinder Uses Two Work Spindles

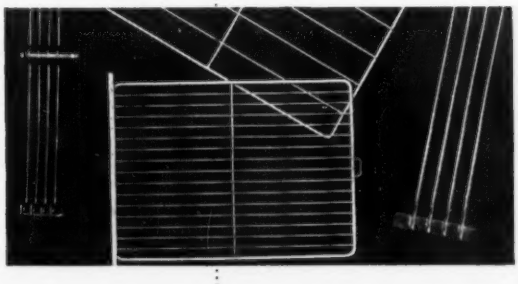
Using two work spindles, this surface grinder handles work to 80 in. wide. Its two powerful spindle motors enable working a variety of surfaces on extremely large pieces in a single setup. The machine has a 60-in. clearance between the grinding wheel bottoms and the table top. Both heads are controlled by the operator from a single pendant. An interlock safety system prevents accidental machine and work damage should someone depress a wrong control button. The table always starts in a forward direction; thus the operator always knows the direction of movement in advance. To move the table to "out" position for loading, the operator merely depresses a "reverse out" button that automatically moves the table to the end of its travel and stops the machine. (Mattison Machine Works.)

For more data circle No. 52 on postcard, p. 143

NEW EQUIPMENT



If you use STAINLESS BARS or WIRE...

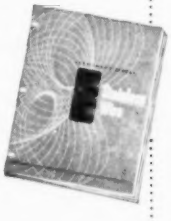


...Let ALLEGHENY LUDLUM help you CUT PRODUCTION COSTS

WRITE FOR YOUR COPIES OF THESE HELPFUL BOOKLETS

ALLEGHENY STAINLESS WIRE

Illustrated 20 page booklet, which fully describes analyses, physical properties, corrosion resistance, principal uses and applications of stainless wire.



ALLEGHENY STAINLESS BARS

Illustrated 28 page booklet, which fully covers alloy selection, fabrication, annealing, heat treating, corrosion resistance and weight of stainless bars.

ADDRESS DEPT. A-951

Whether you use stainless bars and wire to provide lasting, easily-cleaned sparkle for refrigerator shelves, to stand up under the metal-torturing heat of a jet engine or to meet any requirements of resistance to corrosion, heat, wear or great stress, you'll find that the combination of Allegheny Stainless Steel and Allegheny Ludlum technical assistance can offer distinct production advantages that will help your competitive position.

The wide variety of grades, shapes, sizes and finishes of Allegheny Stainless Bars and Wire assures you of ready availability of the material you need. And you can count on the assistance of our Technical Staff with the problems of application and fabrication—to help reduce your machining, welding and finishing costs. Let us work with you.
Allegheny Ludlum Steel Corporation, Oliver Bldg., Pittsburgh 22, Pa.

Make it BETTER and LONGER LASTING with

ALLEGHENY STAINLESS

WSW 6480

AL

ALLEGHENY LUDLUM

Warehouse stocks carried by all Ryerson steel plants

Shears Sheet Lengths With Extreme Accuracy

Special Walkie Truck Handles Heavy Dies

Electrically operated, this walkie type materials handling truck is built especially for handling dies weighing up to 7500 lb. The platform style unit makes use of a hydraulic pusher and puller. It can high stack dies in storage racks, transport and place them directly in press beds. With the pusher-puller attachment, dies are either pulled on or pushed off the platform simply by throwing a switch. Operated from a control handle while walking along with it, this die-handling truck has a 42-in. long, 32-in. wide platform. The horizontal stroke of the pusher-puller is 42 in. An extremely compact handler, it maneuvers in aisles as little as 7 ft wide. It has a platform elevation of 54 in. The load-carrying frame of the unit is supported by four rubber-tired rear wheels and two aluminum caster wheels. (Lewis-Shepard Products, Inc.)

For more data circle No. 53 on postcard, p. 143

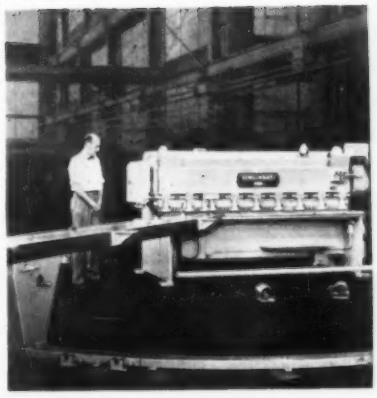
Front-end Loader Is Maneuverable, Versatile

With a rated payload capacity of 19 cu ft, a new front-end loader boasts a struck capacity of the bucket of 14 cu ft. Its maximum lifting load is 3000 lb. The rubber-tired loader features high maneuverability, easy operation and versatility for intra-plant material handling. Turning radius is only 6 ft 2½ in. and there is 5 in. ground clearance. With an average-size operator height is 6 ft 9½ in. (Euclid Div., General Motors Corp.)

For more data circle No. 54 on postcard, p. 143

LOOK...NO HANDS!

Shears Sheet Lengths With Extreme Accuracy



Thanks to a special pivoted angular shearing gage, this 8-ft metal shearing machine can accurately shear steel sheet at any one of numerous design angles. And it does this within a total angular tolerance of only 2 minutes. The pivot point for the angular shearing gage is in the shear table. Traveling on a floor mounted track, the gage support carriage moves and positions rapidly and simply. All gage stops are equipped with micrometer adjustments which provide extreme accuracy in gaging the length of the sheared pieces. This accuracy is insured by the powerful hydraulic holddowns of the shear. These clamp the work with 5 tons of pressure. Operating speed of the shear is 65 strokes per minute. (The Cincinnati Shaper Co.)

For more data circle No. 55 on postcard, p. 143

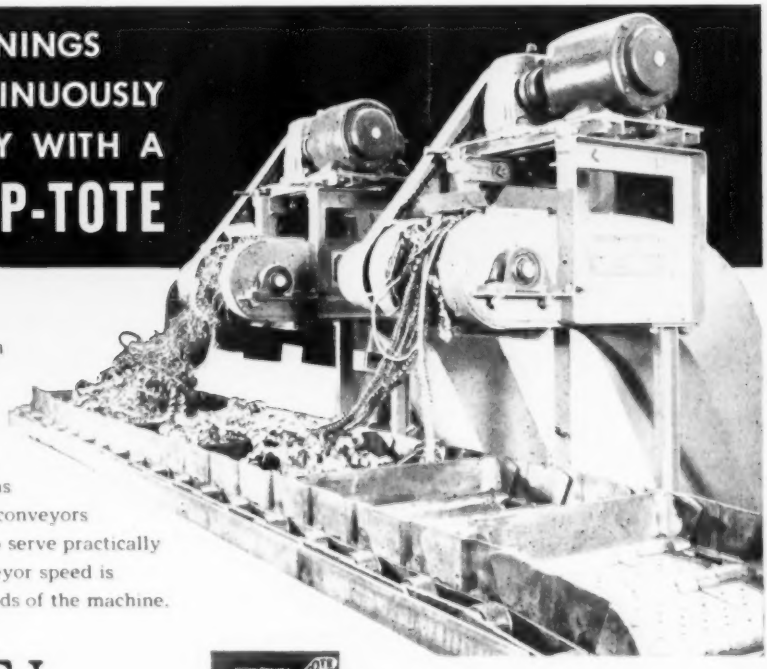
Truck, Container System Speed Waste Removal

Basically for waste collection but applicable to other jobs, this truck-mounted unit employs special mechanical lifting arms for quick loading. When used as a collector, it can speed up waste removal considerably. Rapidly moving from one waste container location to another, the driver engages pick-up channels on the sides of the container with the lifting arms. He dumps the contents through the top bay of the compaction body; this compresses average waste material into one-third its former volume. Thus, the unit loads more than 60 cu yd of material before traveling to the disposal area. The pick-up, dumping and returning cycle require less than 60 seconds—without the driver leaving the cab. (Dempster Bros.)

For more data circle No. 56 on postcard, p. 143

REMOVE CHIPS, TURNINGS AND BORINGS CONTINUOUSLY AND AUTOMATICALLY WITH A

MAY-FRAN CHIP-TOTE



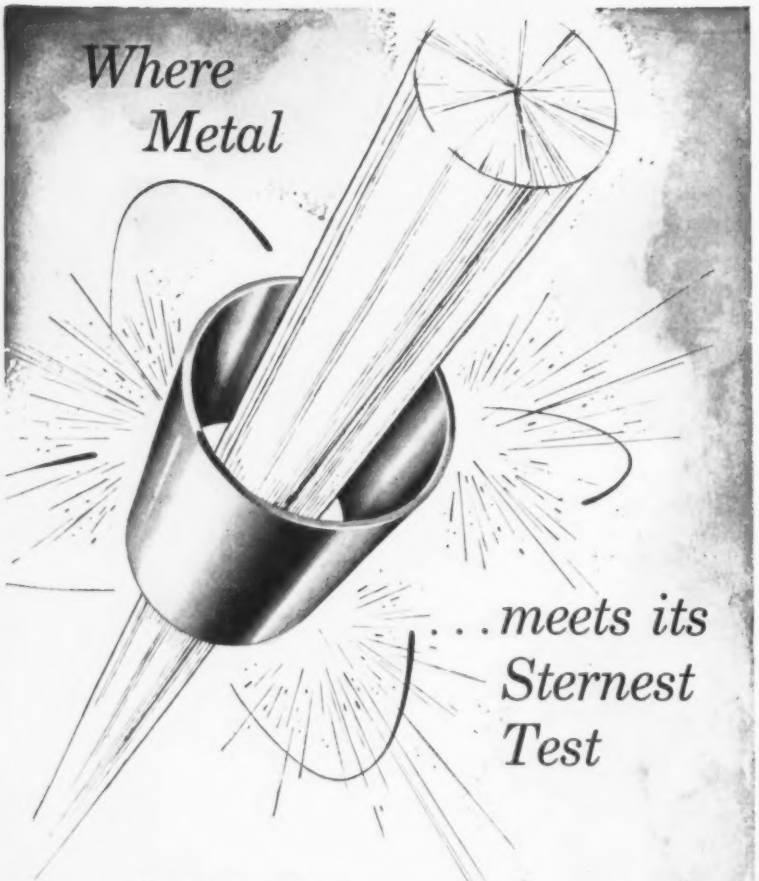
That's right! The May-Fran CHIP-TOTE permits the continuous operation of machine tools by eliminating down-time for scrap removal . . . skilled workers stay on the job . . . production increases by as much as 20%! Versatile CHIP-TOTE conveyors are available in a wide range of sizes to serve practically any type or size of machine tool. Conveyor speed is adjusted to meet the scrap removal needs of the machine.

MAY-FRAN ENGINEERING, INC.

1698 Clarkstone Rd. • Cleveland 12, Ohio

Write today for your copy of Bulletin MF-640.

3721 MF



Reactor components, operating submerged in high-temperature and high-pressure radioactive water, are sealed in protective "cans" of *stainless steel*. Pile control rods, exposed to the same conditions, are clad with sleeves of *stainless steel* and are suspended by cables of *stainless steel*.

In any field — nucleonic, aviation, guided missile — where critical specifications *must* be met, Wallingford Steel can fill the need with stainless and super metal strip or tubing of extremely high quality, excellent corrosion resistance and low heat transfer rates.

Whether your need is quality stainless steel, or super metals with special characteristics, Wallingford Steel can help you. Write today.

Progress in Metals

for over 35 Years

THE WALLINGFORD STEEL CO.

WALLINGFORD, CONN., U.S.A.

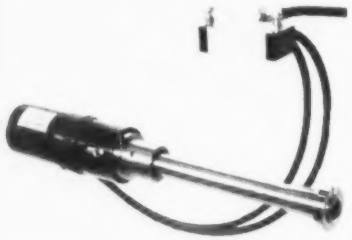
COLD ROLLED STRIP: *Super Metals, Stainless, Alloy*

WELDED TUBES AND PIPE: *Super Metals, Stainless*

NEW EQUIPMENT

Collet Control

This air operated collet control is handy for use of lathes and special purpose machines using draw-in collets or fixtures. It boasts a mechanical accuracy to 4500 rpm though it weighs just 14 lb. Its operation is effortless, fast and vibrationless. Thrust and radial loads

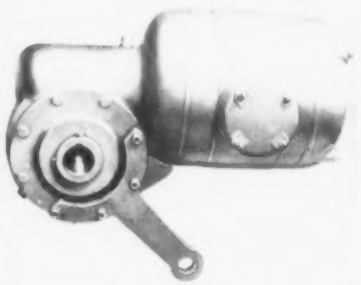


are absorbed by two bearings. And its light, sturdy construction places very little load on the spindle. Vibrationless operation means it can be used on precision grinders as well as turret lathes, secondary operation machines, cutoff units, boring machines, etc. (Adams Equipment).

For more data circle No. 57 on postcard, p. 143

Gearmotors

New shaft mounted right angle gearmotors from ¼ through 5 hp eliminate all intermediate transmission elements, such as couplings and sprockets. Coupled with weight saving characteristics of aluminum construction, these gearmotors provide



a compact, space saving installation especially suitable for lighter pieces of machinery or use in small areas. The gearmotor is built for rugged

continuous duty and meets all AGMA specifications. (Sterling Electric Motors, Inc.)

For more data circle No. 58 on postcard, p. 143

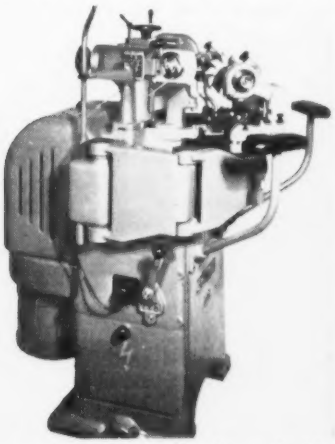
Automated Welder

Now available is an automated flash welder that resistance flash-welds worms to ends of automotive steering gear shafts. Both parts automatically feed from load chutes. They move to a gauge bar for correct weld position. After welding the setup automatically ejects them. A marking device and radial positioner are incorporated in the automatic sequence. And a safety feature stops continuous machine operation if part loading chutes become empty. The welder incorporates a 150-kva transformer. (Federal Machine & Welder Co.)

For more data circle No. 59 on postcard, p. 143

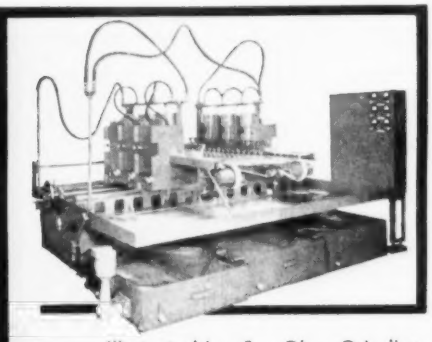
Cutter Grinder

This Swiss form and cutter grinding machine puts sharp, edge pointed teeth on nearly any type cutter. It generates profiles by grinding a land on the periphery of



the teeth. The inclination of this land, the clearance angle, can be selected according to the material. It can be modified at any time. The rake angle can be chosen to suit cutting conditions, without any influence on the profile. Cam relieved cutters may be sharpened in the same manner. The machine consists of a column, articulated links with the "floating" worktable, a wheel-head and dust extracting equipment. Its grinding

Proved in Performance
RUTHMAN GUSHER COOLANT PUMPS



Illustrated is a Sun Glass Grinding Machine made by Sun Tool & Machine Co. and equipped with a Gusher Coolant Pump.

THE MODEL UL 7120

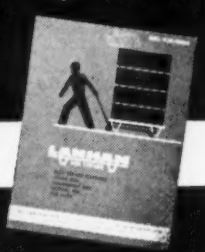
GUSHER COOLANT PUMPS GIVE YOU—
Efficient Operation. Gusher Pumps are always primed, you get split-second coolant delivery.
Long Life. Simply designed with fewer parts, Gusher Pumps are precision built of the best materials.
Minimum Maintenance Cost. Pre-lubricated ball-bearings require no further attention. Gusher Pumps require no packing.

Write today for Catalog

Ruthman MACHINERY CO.
• COOLANT PUMPS
• CIRCULATORS • AGITATORS
• MOLTEN METAL PUMPS
1809-1823 READING ROAD, CINCINNATI 2, OHIO

LANHAM FOR LIFETIME ROLLAWAY JACK SYSTEM
From Skid-Type Storage to Truck-Type Hauling in a Jiffy!

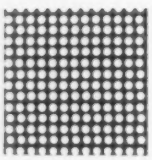
WRITE FOR CATALOG NO. LR-57

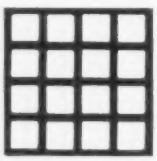


THE LANHAM SKID CO.
746 Mississippi River • Keokuk, Iowa

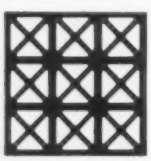
LANHAM MAKES ALL KINDS OF SKIDS AND ALLIED PRODUCTS

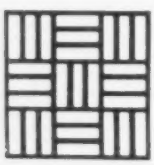
RUSH!
RUSH!
Perforated Steel Sheets from Stock
from H&K


Our large stock of perforated steel sheets consists of many sizes and gauges

In stock—for prompt shipment from our warehouses


Patterns are available for both industrial and decorative uses

Send for H & K stock list brochure for more details



Fill in and mail coupon to nearest office and warehouse

Illustrations shown in reduced size.

THE Harrington & King PERFORATING CO. INC.

Chicago Office and Warehouse: 5619 Fillmore Street, Chicago 44, Ill.
New York Office and Warehouse: 118 Liberty Street, New York 6, N.Y.

Please send me—
☐ GENERAL CATALOG NO. 62
☐ STOCK LIST of Perforated Steel Sheets

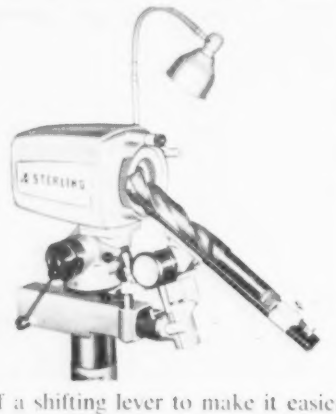
NAME
TITLE
COMPANY
STREET
CITY ZONE STATE

saddle can easily be moved horizontally due to the articulated links. The unit handles right and left hand profiled, taper and cylindrical cutters, straight or spiral fluted, with positive or zero rake angle, arbor and shank type. It'll also take reamers, sinking cutters, profile turning tools, etc. By using a special precision grinding spindle, the machine also contour grinds carbide tipped profile milling cutters. (The Olken Corp.)

For more data circle No. 60 on postcard, p. 143

Drill Grinders

This diamond dresser does a good, fast job of wheel dressing, its maker states. So it is now standard equipment on the company's drill grinders. Other advantages of the grinding units include incorporation



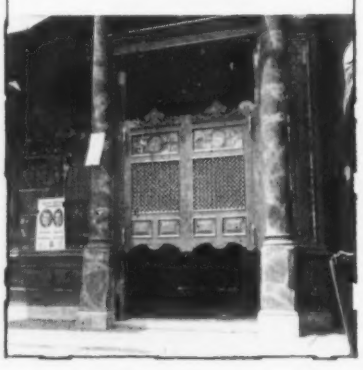
of a shifting lever to make it easier to change set-ups for different drill diameters through a range from $\frac{1}{8}$ to $2\frac{1}{2}$ in. A micrometer drill feed comes with all models. Some units can use 1 hp motors. (McDonough Mfg. Co.)

For more data circle No. 61 on postcard, p. 143

Work Holder

Combining two tools provides the convenience and adaptability of some expensive custom tooling set-ups in one standard unit. The combination consists of a light duty vise and a new universal work positioner. Used on benches, pallets, or conveyors they can save tooling cost and labor, reduce

RUSHING THE GROWLER



Those were the days—down to the corner saloon, at the side entrance, you could bring a pail, bucket, or pitcher, and have it filled with cool draft beer—that was "rushing the growler," a real treat back in 1907. If you preferred you could buy good 7-year old bourbon whiskey by mail order for only $3.20 for *four full quarts*. Or if you lived in a "dry" area, you drank patent medicine—for your "health"—that might contain up to 47% alcohol.

Dreaming of the "good old days" is a popular pastime, but it's not at all entirely realistic. There have been many changes since 1907 that we tend to lose sight of; diversions in 1907 were fewer than today—and there was less time to be diverted in! Products have changed too—and most have changed for the better. Gears are an excellent example; the progress in the design, quality and manufacture of gears in the past 50 years has been remarkable. This progress is continuing today at an ever-increasing tempo, providing an important reason for choosing your custom gear source with care—for choosing a firm with demonstrable ability to keep in the forefront of this progress. A firm, in short, with a record like Cincinnati Gear.

THE CINCINNATI GEAR CO.
CINCINNATI 27, OHIO
Fifty Years of "Gears—Good Gears Only"

CINTI ®

fatigue on electronics and other light assembly jobs. The vise's moveable jaw travels on gibs that are machined to close tolerances, giving a tight, smooth action. The positioner has a work weight capacity up to 15 lbs. The maximum jaw opening of the vise is 2¼ in. Jaw depth is 1⅛ in., and jaw width

is 2¼ in. Jaw faces are of smooth, hard steel. They are removable and replaceable. The screw is 7/16 in. in diameter, Acme threaded. The finish is red hi-gloss baked-on enamel. Ruggedly built, the setup supports a 15 lb work load at 6 in. Dimensions are 4 x 2¾ x 3¾ in. high; each unit weighs about 5 lb. (Wilton Tool Mfg. Co., Inc.)

For more data circle No. 62 on postcard, p. 143

Spade Drills

Designed to speed production of holes in heat-treated alloy steels, stainless steel, titanium and other

types of hard-to-machine metals and castings are new spade drills. The replaceable spade-type drill blades are high-speed steel. Long blade life is insured by the coolant circulating internally through the shank and directing outwardly against each cutting edge. Each shank accommodates a number of individual blade sizes. The design provides considerable chip clearance. Available sizes at present range from 1 1/6 to 5 in.

A flexure test on a glass bar is being made with a Split Cabinet 60,000 lb. ElecTmatic U.T.M. at Corning Glass Works,

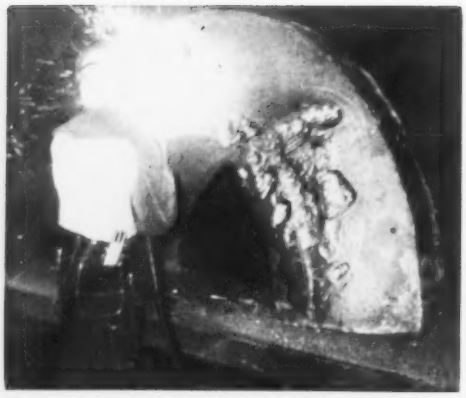
Now you can enjoy all of the testing convenience and accuracy of the Olsen ElecTmatic, plus the advantages of split cabinet design—including no shock transfer . . . maximum floor space utilization . . . ability to locate loading and indicating units in separate areas for remote control testing of explosive or radioactive materials, etc. The only connection between the two cabinets is electrical wiring.

In addition, only the Olsen ElecTmatic gives you a minimum of 100:1 ratio of test ranges . . . four range capacities . . . positive testing speeds under load as well as no load . . . plus the availability of Olsen Electronic Recorders and the widest selection of strain instrumentation available. The low inertia of the Olsen weighing system coupled with fast-acting servos enable the indicating system to follow and indicate the load accurately regardless of the testing speed. Response time for both stress and strain is only 4 seconds for full scale range.

Get the facts about Olsen ElecTmatic testing machines —now available in split cabinet or single cabinet design. Write today for Bulletin 54.

Trademark Reg. U.S. Pat. Off.

TINIUS OLSEN
TESTING MACHINE COMPANY
2120 EASTON ROAD • WILLOW GROVE, PA.
Testing and Balancing Machines



Arcair Torches and Copperclad Electrodes are making this saving and increasing cleaning room productivity in a foundry on the East Coast.

Instead of grinding, chipping, and swing grinding, Arcair removes fins, defects, pads and heads . . . and 32½% more tonnage is produced with nine men as compared to 15 men and other methods.

For full information on ways Arcair can save you money and increase production, write now or call your Arcair Distributor.

Arcair

SAVES FOUNDRY $30,000 A YEAR

Arcair COMPANY

443 S. MT. PLEASANT ST. • LANCASTER, OHIO

WARD STEEL CO.

PROMPT WAREHOUSE SERVICE ONLY

Most Complete Stock in America of

BLUE TEMPERED SPRING STEEL

We believe that the way to sell is to carry a stock which permits satisfying any reasonable warehouse demand

870 Rindge Ave. Ext. Phone UN 4-2460
CAMBRIDGE 40, MASS.

Branch
3042-3058 W. 51st Street, CHICAGO, ILL.
Phone: Grovehill 6-2600

QUANTITY PRODUCTION OF GREY IRON CASTINGS

ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

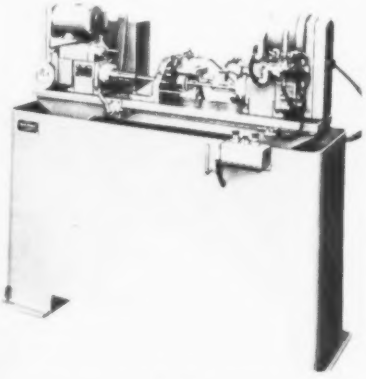
ESTABLISHED 1866
THE WHELAND COMPANY
CHATTANOOGA 2, TENN.

OD with other sizes beyond this range available on special order. (Robert H. Clark Co.)

For more data circle No. 63 on postcard, p. 143

Coolant Systems

New mist coolant systems are of rugged construction with corrosion-proof, heavy-duty moulded polyethylene containers. Dual outlets with precisely machined nozzles give a fine narrow cone spray. The systems come in two standard sizes: 1-gal and 2½-gal. Each has dual



outlets as standard equipment. A high quality needle valve controls the flow of air into the manifold and through the nozzles. A selector control on the manifold permits the use of one or both outlets and also regulates the flow of coolant to the nozzles. The intake tube has a 2⅝-in. diam fine mesh strainer which "snaps" off for easy cleaning. (Graymills Corp.)

For more data circle No. 64 on postcard, p. 143

Liquid Pump

A new electric motor driven pump accurately injects measured amounts of liquid chemicals into flow lines and pressure vessels, against pressures up to 1200-lb. The pump is operated by a ¼-hp, 1750-rpm electric motor. The 50 to 1 reduction worm gear assembly operates the cross head drive mechanism to move the piston injectors. There may be one or two piston injector assemblies on each pump;

each piston may inject measured amounts of a separate chemical at the same time. Output may be accurately pre-set to inject from a few ounces to 40 gallons in a 24-hour period. (Texsteam Corp.)

For more data circle No. 65 on postcard, p. 143

Weight Classifier

For classifying and process control setups, a new basic weight classifier separates products and packages by weight. The classifier is also in use for production line inspection of metal assemblies for missing parts and open or closed packages for correct contents. Adjustable crystal photocells are mounted adjacent to a visual dial on a shadow-type graph scale. The photocells provided a precise and reliable electric signal when the pre-set weight limits, or allowable tolerance settings, are reached. Capacities range from 2000 milligrams up to 100 lbs. (Exact Weight Scale Co.

For more data circle No. 66 on postcard, p. 143

Dynamometers

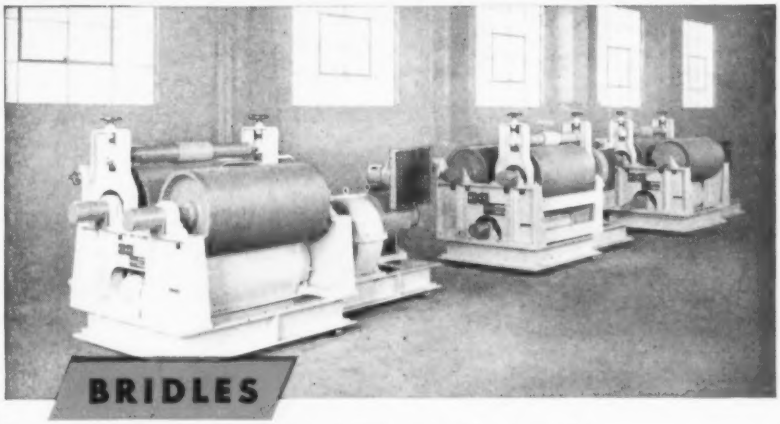
Two new traction-type dynamometers have capacity ratings of 0 to 5000 lb and 0 to 10,000 lb. For precision measuring torque, weight, tension, traction or compression, each unit is individually calibrated.

certified accurate and unconditionally guaranteed. Unaffected by any extremes in temperature, each dynamometer can sustain accidental overload of up to 25 pct without injury to the calibration. (W. C. Dillon & Co., Inc.)

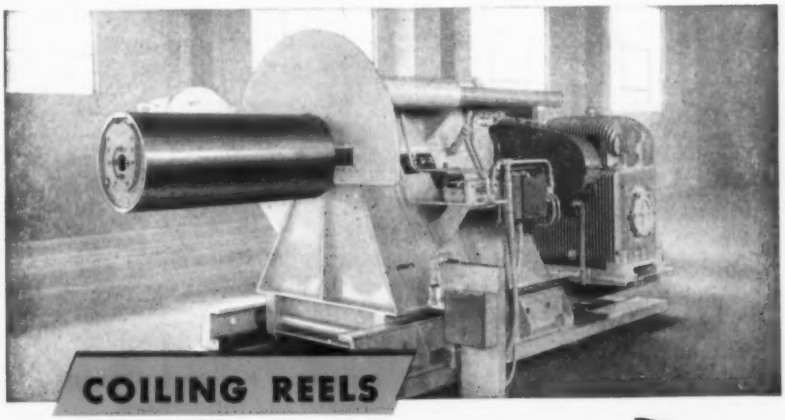
For more data circle No. 67 on postcard, p. 143

HERR EQUIPMENT

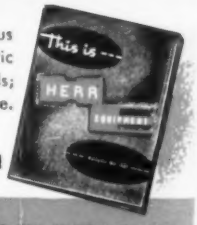
"Complete Processing and Handling Equipment . . . for any Ferrous or Non-Ferrous Material . . . That Starts — or Ends — as a Coil"



Types and sizes to meet any requirement. Plain steel, rubber covered or "Lorig" type self-aligning rolls. Air operated or regenerative brakes. Also four roll type that permits pay-off and coiling reels to be placed at the same end of the line and controlled with a single operator.



Wide variety of types and sizes for coiling ferrous and non-ferrous strip. Fixed, adjustable or automatically aligning bases. Automatic oscillating level winding drive if desired. Link type contracting mandrels; manually or hydraulically operated. Furnished complete ready for use.



Write for fully descriptive Bulletin No. 561 today!

THE HERR EQUIPMENT CORPORATION

1260 VINE STREET • WARREN, OHIO

CLEVELAND, INDIANAPOLIS AND BERKELEY, CALIFORNIA

Why do more stainless buyers call Ryerson?

There are four main reasons:

First, the nation's largest stocks of Allegheny stainless are always on hand at Ryerson—2351 types, shapes, sizes and finishes . . . tons of sheets, plates, bars, angles, pipe, tubing and fittings.

Second, Ryerson knows stainless. As the pioneer supplier of stainless from stock, Ryerson has worked with more stainless users, helped more firms to use the right type to the best advantage. This experience is always available to present and future users.

Third is the equipment for cutting stainless to your specifications. The most modern shears, saws, and flame-cutting machines produce accurate sizes and shapes, in any quantity.

And fourth is Ryerson's ability to deliver any requirement, any quantity—on time.

When you need stainless, or help on stainless problems—call your nearby Ryerson plant.

RYERSON STEEL

Principal Products: Carbon, alloy and stainless steel—bars, structurals, plates, sheets, tubing—aluminum, industrial plastics, metalworking machinery, etc.

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • WALLINGFORD, CONN. • PHILADELPHIA • CHARLOTTE • CINCINNATI • CLEVELAND DETROIT • PITTSBURGH • BUFFALO • INDIANAPOLIS • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

The Iron Age Summary

Steel Backlogs Dropping Fast

Slow pace of new business is eating into mill backlogs. Trend has mills worried.

One bright spot is low user inventories. Business surge would be reflected quickly.

■ Steel men are worried about the volume of incoming orders. New business is running well below output. As a result, order backlogs are dropping fast.

The trend is just the reverse of what steel men had predicted earlier in the year. Sharp competition for the customer's dollar is in the cards over balance of the year and into 1958.

Bright Spot—The one bright spot in the steel outlook is that industry generally is chewing up more steel than it is buying. Inventories in the hands of users have been dropping steadily. Many customers are living hand-to-mouth, gauging their requirements close to their own production schedules. This means that any pickup in the overall economy would be reflected quickly in the volume of steel orders.

Even the prospect of stepped-up automotive output in first half of 1958 isn't giving the mills much to cheer about. The auto companies are expected to stock up on new cars as a hedge against a possible strike of auto workers next summer. But steel men doubt that this would be enough to inject new life into their market.

Foreign Competition — Foreign competition is also eating into the domestic steel market. The latest assault has hit the market for oil country goods. (See page 90.) Italian casing and tubing has been offered in Houston at $10 a ton less than the Pittsburgh-plus-barge U. S. price. Canadian mills have brought in some material at $2 less than what U. S. mills are asking. The Japanese also are nibbling at the oil country goods market.

The mills have done a good job this year in meeting demand for plates and structurals. Nine-month shipments of these products were three million tons over the same period of 1956 and four million tons ahead of 1955. This has made for an inventory bulge in warehouses. But some of the slack may be taken up by increased roadbuilding next year. About 2.4 million tons of steel will go into roadbuilding in '58, and half of this will be in plates, structurals, and related products.

Appliance Buying — Appliance makers are showing some signs of life. This has lifted hopes of a pickup in sheet and strip business in first quarter '58. Still, appliance buyers generally are shying away from long-range commitments. So there's not enough evidence to indicate a definite turn for the better.

Most steel users are playing hard-to-get when it comes to placing new orders. Some steel firms report their sales troubles are as bad as in 1954, but as yet this is by no means true for all steel firms. Many have backlogs much higher than those of early '54.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week	Last Week	Month Ago	Year Ago
	1,971	1,996	2,061	2,474
Ingot Index (1947-1949 = 100)	122.7	124.3	128.3	154.0
Operating Rates				
Chicago	76.0	78.0	80.0	100.0
Pittsburgh	79.0	80.0*	81.0	96.0
Philadelphia	86.0	85.0	88.0	105.0
Valley	66.0	66.0*	67.0	100.0
West	80.0	80.0	85.0	101.0
Buffalo	83.0	80.5	100.0	105.0
Cleveland			94.0	103.5
Detroit	90.0	90.0*	94.0	104.0
S. Ohio River			86.0	96.0
South	60.5	60.5	71.5	96.0
Upper Ohio R.	65.0	71.0	72.5	106.0
St. Louis	89.0	90.0	90.0	100.0
Northeast	40.0	40.0	40.0	100.0
Aggregate	77.0	78.0	80.5	100.5

*Revised

Prices At a Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.967	5.967	5.967	5.622
Pig Iron (Gross ton)	$66.42	$66.42	$66.42	$63.04
Scrap, No. 1 hvy (Gross ton)	$32.67	$33.00	$35.33	$61.33
No. 2 bundles	$24.67	$24.67	$26.33	$48.50
Nonferrous				
Aluminum ingot	28.10	28.10	28.10	27.10
Copper, electrolytic	27.00	27.00	27.00	40.00
Lead, St. Louis	13.30	13.30	13.30	15.80
Magnesium ingot	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	64.50
Tin Straits, N. Y.	89.625	89.50	91.875	112.75
Zinc, E. St. Louis	10.00	10.00	10.00	13.50

Shop Equipment Market Strong

Makers of shelving, benches, cabinets, and tool tenders are enjoying good business.

However, the market is competitive enough to give users a good selection of products and fast delivery.

▪ Business is booming for shop equipment makers and distributors. Most say 1957 orders for shelving, benches, cabinets and tool tenders will easily top last year.

But makers and sellers agree that the field is still competitive. They say consumers can demand, and get, better selection of standard items, for immediate delivery, at competitive price levels. And the trend, they insist, is for an even better market for buyers.

Here's how the manufacturers and distributors see market:

Service Good—On small orders you can practically take it home with you. On large orders, the equipment is on the trucks the same day.

Distributors say this is a definite switch. Traditionally, they warehouse very little, placing a corresponding, rush-order with the supplier on each sale. Says one distributor, "Now customers want fast delivery. If I can't give it to them, they'll find someone who will. So I have to warehouse a wide variety of equipment."

Manufacturers acknowledge that orders from distributors reflect the change—fewer orders but for larger amounts. "But in an emergency they want even faster delivery than before," says a major manufacturer. This has spurred expansion projects in many of the major shop equipment plants.

SPS Expands — Standard Steel Corp., Jenkintown, Pa., for instance, is spending $1.8 million to add 105,000 sq ft of manufacturing and warehouse space. SPS, like most major fabricators in this field, is leaning away from working with sheet stocks, and toward coils. SPS is installing a new Wean line to slit, edge-condition, pierce, blank and perform other operations on steel coils as big as 30,000 lb, and up to 48 in. wide.

Prices Steady—There were several rounds of price increases this year, but few makers bumped prices each time. The latest hike came on the tail of the steel price increase in July. No one sees any further increase, or decrease, until steel moves again.

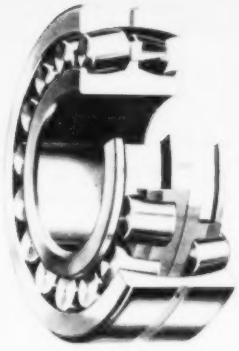
Design Trends — Manufacturers say that the trend in the last five years has been toward cleaner, more orderly shops with maximum utilization of space, and greater flexibility for change. "We've had to incorporate features along these lines or lose our competitive position," says one manufacturer with a full line of shop equipment. Work benches now provide efficient storage space, as well as working surface.

Shelves are designed along modular unit lines. A much greater number of standard sizes can be combined end-to-end, back-to-back, atop of one another, in "L" shaped units, and in "U" shaped units, where they act as partitions as well.

Bracketing Gains—Nut-and-bolt assembly is rapidly giving way to brackets. Makers claim that initial erection is quicker, changes can be made easily with no tools, and without emptying shelves in most cases.

Color is gaining in use on the shop equipment scene. As of now the standard colors are gray and green.

BUYERS' MARKET: Business is booming, but sharp competition keeps shelving, tool benches and minders and other shop equipment a buyers' market. Distributors stock more, can make immediate deliveries.



from
power shovels...

to
helicopters

Torrington makes the right anti-friction bearing for every basic need!

Application requirements differ. A lightweight, high-capacity Torrington Needle Bearing is just right for a helicopter. But it's a different story with a mammoth power shovel, where Torrington Spherical Roller Bearings or Tapered Roller Bearings perform best.

Between these two examples lie all kinds of requirements. To meet the broad range of needs, Torrington makes every basic type of anti-friction bearings.

This range of experience can be of invaluable service to you in engineering your own anti-friction applications. Your Torrington representative is well qualified in your field: call on him for engineering assistance. **The Torrington Company, Torrington, Conn.—and South Bend 21, Ind.**

TORRINGTON BEARINGS

District Offices and Distributors in Principal Cities of United States and Canada

SPHERICAL ROLLER • TAPERED ROLLER • CYLINDRICAL ROLLER • NEEDLE • BALL • NEEDLE ROLLERS • THRUST

STEEL PRODUCT MARKETS

Little Chance For Bar Pickup

Despite good buying by automotive consumers this has been a dismal year for bar mills.

Sales to other users continue off and producers are fighting hard for orders.

▪ Bar producers, mired in a sluggish market, see little chance for any improvement.

Sales will probably finish the year in the downward spiral they've been in all during '57. However, the market's troubles are not the fault of automotive buyers. One bar producer, in fact, indicates auto makers have already taken above 90 pct of the bar they used last year.

But sales to other consumers—non-automotive buyers and the warehouses—are down sharply over previous years.

Dig for Business — Any hopes for a pickup in the market before next year seem slight. One Midwest producer says October cold-finished business ran 40 pct below the same month in '56. And while November is showing some improvement it, too, is below year-ago levels.

Mills are digging deep for orders. Some are shipping out of their normal market areas and absorbing freight to make sales. Others were rolling light structurals until that market also fell off. Orders get prompt scheduling by the producers. They have little trouble fitting requests into current rollings because cancellations are leaving holes to be filled.

Sheet and Strip—Shipments continue to move sideways or drop off a little. Competition for orders on the mill level is based on delivery promises and quality of product. On the warehouse level the pricing of secondary sheets is very competitive. Automotive and appliance firms are placing the only long term orders, some for 1958 delivery. Some mills in the Midwest are operating at 12 turns a week. Highest operating level there is about 17 turns. There's little hope for any stepup in operations. It's pointed out that, because of cancellations, mill tonnage often has to be resold even while it's being rolled. **Eastern** mills look for some improvement in the market after year-end inventory checking is passed. **Detroit** mills report December orders show a downward trend.

Plates and Structurals — Nine-month shipments of plates and structurals, according to the AISI, are 3 million tons over the same period in 1956. And they are 4 million tons above the total for that period in 1955. However, while mills still have some catching up to do on heavy plate, it's clear that plate and structural supply is now matching demand. In some cases it's running ahead of it. Warehouses in many areas are loaded with heavy steel. Factors in the reduced market activity are falloff in freight car building and machinery construction. Heavy structurals are now readily available. Light structurals are extremely slow moving. And wide flange beam producers are able to offer quota customers more tonnage. Heavy shipments from the East are depressing the **West Coast** structural market.

Pipe and Tubing — Oil country buyers are slow indicating first quarter requirements. Stocks of oil country products are piling up in distributors' hands in the **Cleveland** area. As a result a cutback in mill production there is expected by January, if not before then. Inventories of seamless pipe are high. However, while the smaller sizes of linepipe are plentiful, there's been no break in demand for pipe over 22 in. And a **Pittsburgh** mill making the intermediate sizes still has enough business to operate at capacity. Encouraging to producers has been a recent pickup in sales to pipe jobbers.

Wire—Mills expect production to continue at about 60 pct of rated capacity for balance of the year. All products are in easy supply. Deliveries are cut to only required production time in order to land business. Warehouses are cancelling some wire orders placed earlier. Domestic mills report some success in hard sales drive to get orders in face of import competition. Often, however, higher prices of U. S. products are the stumbling block they cannot overcome.

Fasteners — Automotive buying is helping the market and present indications are fastener makers will finish the year strongly. Orders from other users are also good. Deliveries are normal.

Tinplate—Producers are resigned to a dismal fourth quarter, but say prospect of small carryover makes 1958 look brighter.

PURCHASING AGENT'S CHECKLIST

How missiles will affect defense buying. **P. 81**

Imports are hurting U. S. producers of oil country goods. **P. 90**

How to select wear-resistant materials. **P. 121**

COMPARISON OF PRICES

(Effective Nov. 19, 1957)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in **Heavy Type**; declines appear in *Italics*.

	Nov. 19 1957	Nov. 12 1957	Oct. 22 1957	Nov. 20 1956
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.925¢	4.925¢	4.925¢	4.675¢
Cold-rolled sheets	6.05	6.05	6.05	5.75
Galvanized sheets (10 ga.)	6.60	6.60	6.60	6.30
Hot-rolled strip	4.925	4.925	4.925	4.675
Cold-rolled strip	7.17	7.17	7.17	6.870
Plate	5.12	5.12	5.12	4.87
Plates, wrought iron	13.15	13.15	13.15	10.40
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	47.50
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$10.30	$10.30	$10.30	$9.95
Tin plates, electro (0.50 lb.)	9.00	9.00	9.00	8.65
Special coated mfg. ternes	9.55	9.55	9.55	9.20
Bars and Shapes: (per pound)				
Merchant bar	5.425¢	5.425¢	5.425¢	5.075¢
Cold finished bars	7.30	7.30	7.30	6.85
Alloy bars	6.475	6.475	6.475	6.125
Structural shapes	5.275	5.275	5.275	5.00
Stainless bars (No. 302)	45.00	45.00	45.00	40.75
Wrought iron bars	14.45	14.45	14.45	11.50
Wire: (per pound)				
Bright wire	7.65¢	7.65¢	7.65¢	7.20¢
Rails: (per 100 lb.)				
Heavy rails	$5.525	$5.525	$5.525	$5.075
Light rails	6.50	6.50	6.50	6.00
Semifinished Steel: (per net ton)				
Rerolling billets	$77.50	$77.50	$77.50	$74.00
Slabs, rerolling	77.50	77.50	77.50	74.00
Forging, billets	96.00	96.00	96.00	91.50
Alloy blooms, billets, slabs	114.00	114.00	114.00	107.00
Wire Rod and Skelp: (per pound)				
Wire rods	6.15¢	6.15¢	6.15¢	5.80¢
Skelp	4.875	4.875	4.875	4.225
Finished Steel Composite: (per pound)				
Base price	5.967¢	5.967¢	5.967¢	5.622¢

	Nov. 19 1957	Nov. 12 1957	Oct. 22 1957	Nov. 20 1956
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.51	$70.51	$70.51	$67.76
Foundry, Valley	66.50	66.50	66.50	63.00
Foundry, Southern Cin'ti	71.65	71.65	71.65	67.17
Foundry, Birmingham	62.50	62.50	62.50	59.00
Foundry, Chicago	66.50	66.50	66.50	63.00
Basic, del'd Philadelphia	70.01	70.01	70.01	66.84
Basic, Valley furnace	66.00	66.00	66.00	62.50
Malleable, Chicago	66.50	66.50	66.50	63.00
Malleable, Valley	66.50	66.50	66.50	63.00
Ferromanganese, 74-76 pct Mn, cents per lb‡	12.25	12.25	12.25	11.75
Pig Iron Composite: (per gross ton)				
Pig iron	$66.42	$66.42	$66.42	$63.04
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$33.50	$32.50	$35.50	$62.50
No. 1 steel, Phila. area	33.00	34.00	37.00	58.50
No. 1 steel, Chicago	31.50	32.50	33.50	63.00
No. 1 bundles, Detroit	24.50	24.50	25.50	60.50
Low phos., Youngstown	33.50	33.50	35.50	68.50
No. 1 mach'y cast, Pittsburgh	50.50	50.50	52.50	61.50
No. 1 mach'y cast, Philadel'a	50.50	50.50	50.50	58.00
No. 1 mach'y cast, Chicago	40.50	40.50	41.50	58.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$32.67	$33.00	$35.33	$61.33
No. 2 bundles	24.67	24.67	26.33	48.50
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$15.38	$15.38	$15.38	$15.50
Foundry coke, prompt	$17.50-$19	$17.50-$19	$17.50-$19	$18-19
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	27.00	27.00	27.00	40.00
Copper, Lake, Conn.	27.00	27.00	27.00	40.00
Tin, Straits, N. Y.	89.625¢	89.50	91.25	112.75
Zinc, East St. Louis	10.00	10.00	10.00	13.50
Lead, St. Louis	13.30	13.30	13.30	15.80
Aluminum, virgin ingot	28.10	28.10	28.10	27.10
Nickel, electrolytic	74.00	74.00	74.00	64.50
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	33.00	33.00	33.00	33.00

‡ Tentative. † Average.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

INDEX TO PRICE PAGES

Prices At a Glance 179
Comparison of Prices 183
Bars 193
Billets, Blooms and Slabs 191
Boiler Tubes 195
Bolts, Nuts, Rivets, Screws 196
Clad Steel 195
Coke 195
Electrical Sheets 195
Electrodes 195
Electroplating Supplies 196
Ferroalloys 198
Iron Ore 195
Merchant wire products 195
Metal Powders 196
Nonferrous
- Mill products 188
- Primary prices 179-186-188
- Remelted metals 188
- Scrap 188

Pig Iron 197
Pipe and Tubing 191
Plates 193
Rails 195
Refractories 195
Shapes 191
Sheets 192
Spring Steel 195
Stainless 197
Steel Scrap 184
Strip 191
Structurals 191
Tinplate 192
Tool Steel 195
Track Supplies 195
Warehouse Prices 196
Water Pipe Index 196
Wire 193
Wire Rod 192

(Advertisement)

Imported Steel delivered on Domestic Terms

No red tape! We deliver to any place in North America. Over 10 years of service to more than 2000 North American accounts as a domestic firm, on domestic terms with lower costs or better deliveries. Write for "How to be at home with products made abroad" and the address of your local Kurt Orban Company representative.

Prices per 100 lbs. (except where otherwise noted) landed, including customs duty, but no other taxes.

	Atlantic & Gulf Coast	West Coast	Vancouver	Montreal
Deformed Bars (⅝" Dia. incl. all extras)	$6.52	$6.77	$6.64	$6.25
Merchant Bars (1¼" Round incl. all extras)	7.62	7.85	7.48	7.22
Bands (1"x⅛"x20' incl. all extras)	7.76	7.98	7.65	7.38
Angles (2"x2"x¼" incl. all extras)	6.57	6.75	6.99	6.69
Beams & Channels (base)	6.82	7.00	7.24	6.94
Furring Channels (C.R. ⅞", per 1000')	26.62	27.77		
Barbed Wire (per 82 lb. net reel)	6.95	7.40	7.75	7.80
Nails (bright, common, 20d and heavier)	8.12	8.32	8.97	8.79
Larssen Sheet Piling (section II, new, incl. size extra)	7.80	8.10	8.10	7.80
Wire, Manufacturer's bright, low C, (11½ ga.)	7.38	7.52	8.52	8.52
Wire, Galv., Fence Qual., Low C (11½ Gauge)	8.01	8.15	9.42	9.42
Wire, Merchant quality, bl. ann., (10 ga.)	7.60	7.75	8.78	8.78
Rope Wire (.045", 247,000 PSI, incl. extras)	13.60	13.75	13.00	13.00
Wire, fine and weaving, low C, (20 ga.)	10.66	10.80	10.17	12.17
Tie Wire, autom. baler (14½ ASWG, 97 lbs. net)	9.58	9.73	9.64	9.54
Merchant Pipe (½" galv. T & C, per 100')	8.48	8.85		
Casing (5½", 15.5 J55, T & C, per 100')	180.00	191.00		
Tubing (2⅞", 6.4 J55, EUE, per 100')	98.00	99.00		
Forged R Turn. Bars, C-1035 (from 10" dia.)	13.50	13.73	13.50	13.24

Ask prices on: Bulb tees, bolts and nuts, manganese steel plates and shapes, welded wire reinforcing mesh and hardware cloth, boiler tubes, A-335-P11 pressure pipe.

from prominent century-old West German Mills

Through Stahlunion-Export GmbH

BOCHUMER VEREIN World's first Steel Foundry, 1842. Vacuum degassed Forgings. Pinion wire and spring wire for watches and clocks.

DORTMUNDER UNION Originators of Interlock Sheet Piling, Larssen Sheet Piling, Plate, Shapes, Forged Bars and Shafts.

NIEDERRHEIN Europe's most modern Rod Mill. OH, CH, Low Metalloid, Specialty Wire Rod, Merchant Bars.

WESTFAELISCHE UNION Europe's largest Wire Mill. All types drawn Wire and Wire Products. Nails, Barbwire, Wire Rope, Prestress Concrete Wire and Strand.

PHOENIX RHEINROHR Europe's largest Pipe Mill. Pipe, Tubing, Flanges, Welding Fittings, Precision Tubes, Tubular Masts.

Ask us to quote on your requirements

KURT ORBAN COMPANY, INC., 50 Exchange Place, Jersey City 2, N. J.

In Canada: Kurt Orban Canada, Ltd., Vancouver, Toronto, Montreal

IRON AND STEEL SCRAP MARKETS

"Realistic" Price Bottom Near

Pittsburgh rally shows prices can get too low to move scrap regardless of tonnage.

This doesn't mean the market is strengthening. Demand is low and little hope of a rebound is seen anywhere.

▪ A slight rally in Pittsburgh and continued evidence of mild buying on the down market are the most significant scrap indicators.

But even the $1 rise in steelmaking grades in Pittsburgh does not represent any real strengthening of the market. Instead, quoted prices and offerings had dropped too low to move even small tonnages.

In some consuming areas, the market is a little stronger than it looks on the surface. In Chicago, prices of primary grades dropped, but other grades held firm and perhaps are more representative than indicated by the $1 decline in No. 1 grades.

There is no indication of any marked change. If the bottom is reached, it is just because it is unrealistic to quote prices lower than the minimum figure to bring scrap out. In that line, some brokers say they are already paying slightly over mill price to cover orders. This has no appreciable strengthening effect, however.

On the East Coast, export may be improving slightly. It is not expected to return to levels of a year ago, even the optimists agree.

In spite of the continued high use of hot metal, blast furnace grades are no stronger than steelmaking. Since the June 20 summer high, turnings grades have dropped about 47 pct while the No. 1 Heavy Melting Composite price has declined 42 pct from $56.17 to $32.67.

Pittsburgh—Prices of openhearth grades are up $1. The upward movement resulted from prices dropping too low to move even small tonnages. There is still not enough strength in demand to bring a sustained price climb and some jockeying is expected before the market takes off in either direction.

As an indication of the market: One mill dropped No. 2 bundles price to $29. It met resistance at this level and is now offering $30 and $31.

Chicago — Although some mills dropped their operating rates sharply, the market held relatively firm. Spreads widened in a period of small tonnage sales and a generally confused demand picture. Variations of as much as $5 in prices for a single grade occurred over the past week. Primary steelmaking grades dropped on the basis of a small buy, but other grades are holding firm. Price of low phos, 3 ft and under, was incorrectly quoted in Nov. 14 issue. Correct price was $39 to $40.

Philadelphia — Low phos grades took a $3 dive and other steelmaking grades are off $1. The domestic market continues weak, with most of the activity involving one mill. The trade is hoping for a pickup in export, which looks a little more active, although far below the level of earlier this year.

New York—Piecemeal export orders keep steelmaking grade prices at levels of recent weeks. But there is little else to hold up the market. Further declines seem in the cards. Turnings cling to their low levels, and not even stepped-up use of hot metal has raised them. Cast grades fell $2 on recent buys.

Detroit—"No business" describes the local market. There is some small hope, but few indications to date that export to Canada will aid the market during the winter. Railroads have indicated water rates will continue after the Lakes shipping season closes.

Cleveland—One small restricted purchase of No. 1 factory bundles was made by a Valley mill at $36, but overall market trend is still down. Sources are drying up because of price. Heavy tonnage of auto lists is expected to hold the price down, however.

St. Louis—The market appears to be leveling off, with very little being offered at prevailing prices. Borings and turnings are from $1 to $3 higher since the generation of these items has declined to below demand.

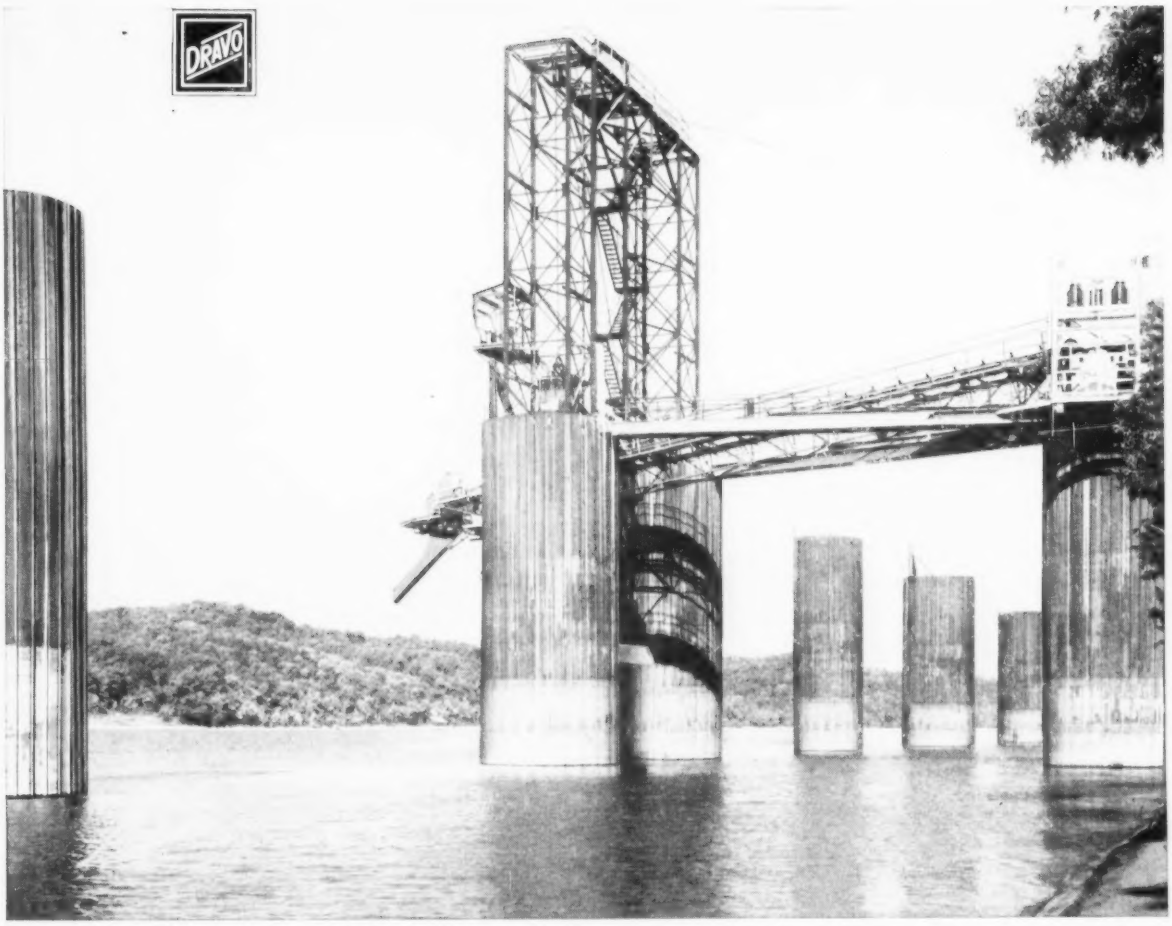
Birmingham — A large electric mill bought a sizable tonnage of electric furnace steel and a small tonnage of bundles at quoted prices. Most other sales are small. Dealers believe the decline in prices has just about ended.

Cincinnati—Dealers are shipping only small tonnages necessary to meet operating expenses. This makes filling of orders slow. Mills are in no hurry either. Blast furnace grades are the only bright spot.

Buffalo — The market continues in the doldrums. Dealers here hope that prices have reached rock bottom. Inventories continue very low.

Boston — Prices of steelmaking, blast furnace, and most cast grades are off $1 in a continuation of the weak market.

West Coast—Pessimism prevails as the market continues slow in all Coast consuming areas. Talk of increased export has lost much of its vigor.



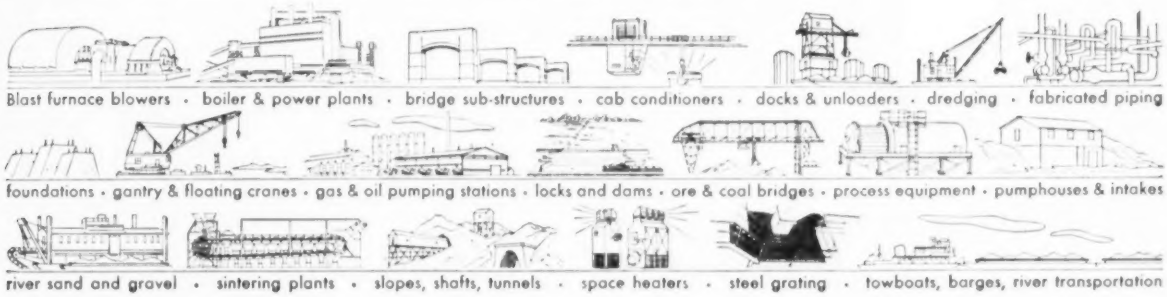
"MILLION TON" dock for new DeKoven Mine

Pittsburgh & Midway Coal Mining Company can load more than a million tons of coal annually at this modern, cellular type barge dock near Sturgis, Kentucky, on the Ohio River. A two-mile long, 42 inch conveyor belt connects the facility with the company's new DeKoven mine.

Eleven cells, three of which support the loading mechanism, are spaced along 1175 feet of shoreline. Constructed of interlocking sheets of steel piling driven to rock, each cell is filled with sand and gravel and topped with concrete. Ruggedness, economy and minimum maintenance make this an ideal type of dock for most purposes.

In the past eight years, Dravo has installed more than 100 of these docks for firms in the chemical, steel, coal, utility, railroad, petroleum and other industries. For more information on this or any of the products and services shown below, write to DRAVO CORPORATION, PITTSBURGH 25, PENNSYLVANIA.

DRAVO
CORPORATION


Blast furnace blowers · boiler & power plants · bridge sub-structures · cab conditioners · docks & unloaders · dredging · fabricated piping
foundations · gantry & floating cranes · gas & oil pumping stations · locks and dams · ore & coal bridges · process equipment · pumphouses & intakes
river sand and gravel · sintering plants · slopes, shafts, tunnels · space heaters · steel grating · towboats, barges, river transportation

SCRAP PRICES *(Effective Nov. 19, 1957)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 dealer bundles	33.00 to 34.00
No. 1 factory bundles	35.00 to 36.00
No. 2 bundles	29.00 to 30.00
No. 1 busheling	33.00 to 34.00
Machine shop turn.	17.00 to 18.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	21.00 to 22.00
Low phos. punch'gs plate	37.00 to 38.00
Heavy turnings	32.00 to 33.00
No. 1 RR hvy. melting	36.00 to 37.00
Scrap rails, random lgth.	49.00 to 50.00
Rails 2 ft and under	56.00 to 57.00
RR steel wheels	48.00 to 49.00
RR spring steel	48.00 to 49.00
RR couplers and knuckles	48.00 to 49.00
No. 1 machinery cast	50.00 to 51.00
Cupola cast	39.00 to 40.00
Heavy breakable cast	37.00 to 38.00

Chicago

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	31.00 to 32.00
No. 1 factory bundles	36.00 to 37.00
No. 2 bundles	20.00 to 21.00
No. 1 busheling	31.00 to 32.00
Machine shop turn.	16.00 to 17.00
Mixed bor. and turn.	18.00 to 19.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	18.00 to 19.00
Low phos. forge crops	45.00 to 46.00
Low phos. punch'gs plate	40.00 to 41.00
Low phos. 2 ft and under	39.00 to 40.00
No. 1 RR hvy. melting	37.00 to 38.00
Scrap rails, random lgth.	41.00 to 42.00
Rerolling rails	48.00 to 49.00
Rails 2 ft and under	47.00 to 48.00
Locomotive tires cut	44.00 to 45.00
Cut bolsters & side frames	43.00 to 44.00
Angles and splice bars	46.00 to 47.00
RR steel car axles	48.00 to 49.00
RR couplers and knuckles	43.00 to 44.00
No. 1 machinery cast	40.00 to 41.00
Cupola cast	35.00 to 36.00
Heavy breakable cast	33.00 to 34.00
Cast iron brake shoe	35.00 to 36.00
Cast iron wheels	41.00 to 42.00
Malleable	48.00 to 49.00
Stove plate	33.00 to 34.00
Steel car wheels	46.00 to 47.00

Philadelphia Area

No. 1 hvy. melting	$32.50 to $33.50
No. 2 hvy. melting	29.50 to 30.50
No. 1 dealer bundle	33.50 to 34.50
No. 2 bundles	23.50 to 24.50
No. 1 busheling	32.50 to 33.50
Machine shop turn.	21.00 to 22.00
Mixed bor. short turn.	22.00 to 23.00
Cast iron borings	22.00 to 23.00
Shoveling turnings	23.00 to 24.00
Clean cast chem. borings	30.00 to 31.00
Low phos. 2 ft and under	41.00 to 42.00
Low phos. 2 ft and under	42.00 to 43.00
Low phos. punch'gs	42.00 to 43.00
Elec. furnace bundles	36.00 to 37.00
Heavy turnings	29.50 to 30.50
RR steel wheels	45.00 to 46.00
RR spring steel	45.00 to 46.00
Rails 18 in. and under	54.00 to 55.00
Cupola cast	37.00 to 38.00
Heavy breakable cast	37.00 to 38.00
Cast iron car wheels	41.00 to 42.00
Malleable	46.00 to 47.00
Unstripped motor blocks	32.00 to 33.00
No. 1 machinery cast	50.00 to 51.00

Cleveland

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	22.00 to 23.00
No. 1 dealer bundles	29.00 to 30.00
No. 1 factory bundles	32.50 to 33.50
No. 2 bundles	21.00 to 22.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Cut struct'l & plates, 2 ft & under	35.00 to 36.00
Drop forge flashings	28.00 to 29.00
Low phos. punch'gs, plate	30.00 to 31.00
Foundry steel, 2 ft & under	33.00 to 34.00
No. 1 RR heavy melting	24.00 to 25.00
Rails 2 ft and under	55.00 to 56.00
Rails 18 in. and under	56.00 to 57.00
Railroad grate bars	16.00 to 17.00
Steel axle turnings	17.00 to 18.00
Railroad cast	42.00 to 43.00
No. 1 machinery cast	45.00 to 46.00
Stove plate	40.00 to 41.00
Malleable	54.00 to 55.00

Youngstown

No. 1 hvy. melting	$32.00 to $33.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	32.00 to 33.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	16.00 to 17.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	20.00 to 21.00
Low phos. plate	33.00 to 34.00

Buffalo

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	27.50 to 28.50
No. 1 busheling	30.00 to 31.00
No. 1 dealer bundles	30.00 to 31.00
No. 2 bundles	24.50 to 25.50
Machine shop turn.	14.00 to 15.00
Mixed bor. and turn.	15.00 to 16.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	16.00 to 17.00
Low phos. plate	36.00 to 37.00
Scrap rails, random lgth.	42.00 to 43.00
Rails 2 ft and under	52.00 to 53.00
RR steel wheels	39.00 to 40.00
RR spring steel	35.00 to 36.00
RR couplers and knucklers	35.00 to 36.00
No. 1 machinery cast	42.00 to 43.00
No. 1 cupola cast	37.00 to 38.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$23.00 to $24.00
No. 2 hvy. melting	20.00 to 21.00
No. 1 dealer bundles	23.00 to 24.00
No. 2 bundles	18.00 to 19.00
No. 1 busheling	22.00 to 23.00
Drop forge flashings	22.00 to 23.00
Machine shop turn.	9.00 to 10.00
Mixed bor. and turn.	11.00 to 12.00
Shoveling turnings	11.00 to 12.00
Cast iron borings	11.00 to 12.00
Low phos. punch'gs plate	23.00 to 24.00
No. 1 cupola cast	31.00 to 32.00
Heavy breakable cast	26.00 to 27.00
Stove plate	26.00 to 27.00
Automotive cast	34.00 to 35.00

St. Louis

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	26.00 to 27.00
Machine shop turn.	16.00 to 17.00
Cast iron borings	18.00 to 19.00
Shoveling turnings	18.00 to 19.00
No. 1 RR hvy. melting	38.50 to 39.50
Rails, random lengths	42.00 to 43.00
Rails, 18 in. and under	48.00 to 49.00
Angles and splice bars	41.00 to 42.00
Std. steel car axles	45.00 to 46.00
RR specialties	43.00 to 44.00
Cupola cast	42.00 to 43.00
Heavy breakable cast	35.00 to 36.00
Cast iron brake shoes	37.00 to 38.00
Stove plate	35.00 to 36.00
Cast iron car wheels	37.00 to 38.00
Rerolling rails	49.00 to 50.00
Unstripped motor blocks	35.00 to 36.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$20.00 to $21.00
No. 2 hvy. melting	21.00 to 22.00
No. 1 dealer bundles	23.00 to 24.00
No. 2 bundles	13.00 to 14.00
No. 1 busheling	23.00 to 24.00
Elec. furnace, 2 ft & under	32.00 to 33.00
Machine shop turn.	9.50 to 10.50
Mixed bor. and short turn.	9.50 to 10.50
Shoveling turnings	10.00 to 11.00
Clean cast chem. borings	15.00 to 16.00
No. 1 machinery cast	34.00 to 35.00
Mixed cupola cast	28.00 to 29.00
Heavy breakable cast	25.00 to 26.00
Stove plate	26.00 to 27.00
Unstripped motor blocks	27.00 to 28.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	26.00 to 27.00
No. 2 dealer bundles	19.00 to 20.00
Machine shop turn.	11.00 to 12.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	15.00 to 16.00
Clean cast. chem. borings	23.00 to 24.00
No. 1 machinery cast	34.00 to 35.00
Mixed yard cast	29.00 to 31.00
Charging box cast	30.00 to 31.00
Heavy breakable cast	30.00 to 31.00
Unstripped motor blocks	27.00 to 28.00

Birmingham

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	31.00 to 32.00
No. 2 bundles	16.00 to 17.00
No. 1 busheling	31.00 to 32.00
Machine shop turn.	20.00 to 21.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	15.00 to 16.00
Electric furnace bundles	35.00 to 36.00
Elec. furnace, 3 ft & under	33.00 to 34.00
Bar crops and plate	38.00 to 39.00
Structural and plate, 2 ft	38.00 to 39.00
No. 1 RR hvy. melting	34.00 to 35.00
Scrap rails, random lgth.	41.00 to 42.00
Rails, 18 in. and under	49.00 to 50.00
Angles & splice bars	40.00 to 41.00
Rerolling rails	50.00 to 51.00
No. 1 cupola cast	47.00 to 48.00
Stove plate	47.00 to 48.00
Charging box cast	22.00 to 23.00
Cast iron car wheels	37.00 to 38.00
Unstripped motor blocks	35.00 to 36.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$29.50 to $30.50
No. 2 hvy. melting	24.50 to 25.50
No. 1 dealer bundles	29.50 to 30.50
No. 2 bundles	21.00 to 22.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	18.00 to 19.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	18.00 to 19.00
Low phos., 18 in. and under	37.00 to 38.00
Rails, random length	44.00 to 45.00
Rails, 18 in. and under	54.00 to 55.00
No. 1 cupola cast	35.00 to 36.00
Hvy. breakable cast	32.00 to 33.00
Drop broken cast	47.00 to 48.00

San Francisco

No. 1 hvy. melting		$36.00
No. 2 hvy. melting		34.00
No. 1 dealer bundles		34.00
No. 2 bundles		26.00
Machine shop turn.		20.00
Cast iron borings		20.00
No. 1 RR hvy. melting		36.00
No. 1 cupola cast		47.00

Los Angeles

No. 1 hvy. melting		$36.00
No. 2 hvy. melting		34.00
No. 1 dealer bundles	33.00 to	34.00
No. 2 bundles	20.00 to	21.00
Machine shop turn.		15.00
Shoveling turnings		19.00
Cast iron borings		19.00
Elec. furn. 1 ft and under (foundry)	46.00 to	47.00
No. 1 RR hvy. melting		36.00
No. 1 cupola cast	11.00 to	12.00

Seattle

No. 1 hvy. melting		$36.00
No. 2 hvy. melting		34.00
No. 2 bundles		27.00
No. 1 cupola cast		38.00
Mixed yard cast		38.00

Hamilton, Ont.

No. 1 hvy. melting		$35.00
No. 2 hvy. melting		30.00
No. 1 dealer bundles		35.00
No. 2 bundles		25.00
Mixed steel scrap		30.00
Busheling		25.00
Bush., new fact., prep'd		35.00
Bush., new fact., unprep'd		29.00
Machine shop turn.		20.00
Short steel turn.		24.00
Mixed bor. and turn.		20.00
Rails, rerolling		44.00
Cast scrap	45.00 to	50.00

NONFERROUS MARKETS

competition, non-integrated com-

look to
Luria Brothers & Co., Inc.
for complete
Service & Coverage
of

STAINLESS STEEL SCRAP
NICKEL-CHROME SCRAP

Luria Brothers and Company, Inc.

main office **PHILADELPHIA NATIONAL BANK BUILDING,** *Phila. 7, Pa.*

PLANTS

LEBANON, PENNA. — DETROIT (ECORSE), MICHIGAN
READING, PENNA. — PITTSBURGH, PENNA.
MODENA, PENNA.
ERIE, PENNA.

OFFICES

BIRMINGHAM, ALA. — CLEVELAND, OHIO — LOS ANGELES, CAL. — READING, PENNA.
BOSTON, MASS. — DETROIT, MICHIGAN — NEW YORK, N. Y. — ST. LOUIS, MISSOURI
BUFFALO, N. Y. — HOUSTON, TEXAS — PITTSBURGH, PENNA. — SAN FRANCISCO, CAL.
CHICAGO, ILLINOIS — LEBANON, PENNA. — PUEBLO, COLORADO — SEATTLE, WASH.
in Canada—MONTREAL, QUEBEC — HAMILTON, ONTARIO

IMPORT & EXPORT – **LIVINGSTON & SOUTHARD, INC.,** 99 Park Ave., New York, N. Y. • *Cable Address:* **FORENTRACO**

newly completed Ravenswood, W. I

NONFERROUS MARKETS

Zinc-Lead Producers Ask Import Quota

Domestic industry says tariff hikes will help, but that this just isn't enough.

Still, request for import restriction expected to meet opposition, despite silence of major users.

▪ Consensus of the zinc-lead industry: A Tariff Commission recommendation for higher zinc (2.1¢ per lb) and lead (2.55¢ per lb) duties will be on the President's desk by January. Ike will follow through with whatever the Commission prescribes, say industry sources.

Hardly anyone is willing to hazard a guess on the import quota question. It is the major bone of contention, and subject of the key testimony in this week's hearings before the Commission.

For and Against — Here's the situation: Lined up in favor are domestic miners and refiners of lead and zinc, actively supported by Congressmen from mining states. Opposed are importers, refiners with foreign connections, representatives from countries that would be affected, and some consumers. The State Dept. is not taking an active part, but is opposed to import restrictions because it would have to renegotiate trade agreements.

Notably silent are a number of major consumers of both lead and zinc. Privately, they are opposed to import quotas. But they consider the issue a double-edged sword. Says the purchasing agent of a major lead consumer: "We might require protection from imports ourselves someday. Anything we say now could come home to roost."

Seeks Support—A major importer sent letters to consumers pointing out their interests lie with no restriction on imports. A spot check indicates he got lots of moral support, but only limited offers of assistance from the more influential consumers.

Whatever is done will have widespread results. For instance, other industries, like brass and bronze fabricators, are sitting on the sidelines waiting for a precedent. And countries sending lead and zinc to the U. S. have promised retaliation to the extent to which they are hurt.

Tariff Called Political — M. D. Schwartz, president, Pacific Smelting Co., told a National Assn. of Waste Material Dealers meeting to expect the zinc tariff to be raised, "as a political expedient." He calls the measure "more artificial medicine," and doesn't believe it will bring immediate stability to the market.

Aluminum

Non-integrated fabricators have improved their market position over the last seven years. This is what Joseph H. McConnell, general counsel and a member of the executive committee of Reynolds Metals Co., told the subcommittee on minerals and raw materials of the House Small Business Committee.

The Reynolds director provided the group, better known as the Yates Committee, with statistics to back up his point:

In extrusions, area of sharpest competition, non-integrated companies' share of the market has climbed from 35 pct in 1950 to over 64 pct today, said Mr. McConnell. There are over 25,000 manufacturers now using aluminum in their products, compared to only about 4500, 10 years ago.

Shipments (net tons)

	Independents	Big 3
1950	363,500	709,000
1957	807,500	971,000
Increase	444,000	262,000
	122 pct	37 pct

Can the small fabricator get the primary aluminum he needs? Here is Mr. McConnell's picture of the growth of Reynolds' shipments to non-integrated fabricators:

1946—4500 tons
1950—33,500 tons
1955—98,200 tons
1956—114,050 tons

The Reynolds' spokesman referred to the hot metal contracts between his company and several automakers. He called hot metal a "fourth primary aluminum product" with a price based on the savings over pig and ingot. He also pointed out that such contracts were vital in getting financing to build several new plants which sell substantial quantities of aluminum to independent fabricators.

Kaiser Aluminum & Chemical Co. poured the first metal from its

Primary Prices

(cents per lb)	Current price	last price	date of change
Aluminum pig	26.00	26.00	8/1/57
Aluminum ingot	28.10	27.10	9/1/57
Copper (E)	27.00	28.50	9/3/57
Copper (CS)	25.50	26.00	11/13 57
Copper (L)	27.00	28.50	9/3/57
Lead, St. L.	13.30	13.80	10/14/57
Lead, N. Y.	13.80	14.00	10/14/57
Magnesium ingot	36.00	34.00	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	74.00	84.50	12/8/56
Titanium sponge	165-250	165-225	5/8/57
Zinc, E. St. L.	10.00	10.50	7/1/57
Zinc, N. Y.	10.50	11.00	7/1/57

ALUMINUM: 99% ingot frt allwd. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig. Velasco, Tex. NICKEL: Port Colbourne, Canada. ZINC: prime western. TIN: see right; other primary prices, pg. 190.

newly completed Ravenswood, W. Va., operation. The plant is set to become completely operational early next year.

Kaiser will have invested over $200 million for an annual capacity of 145,000 tons of primary aluminum and 170,000 tons of rolled products.

Power will be supplied by the Ohio Power Co. under a 40-year contract. It will be generated by burning coal.

Copper

Both U. S. and foreign copper producers improved production and deliveries in October over the previous month. But stocks on hand at refineries at the end of the period were up overseas and down in this country. The domestic improvement was not enough to balance the foreign increase and total stocks at world refineries were higher:

Domestic (net tons)

	October	September
refined	129,862	117,078
delivered	114,203	102,925
stocks on hand	166,976	176,813

Foreign (net tons)

	October	September
refined	137,106	110,659
delivered	132,087	122,113
stocks on hand	261,015	242,116

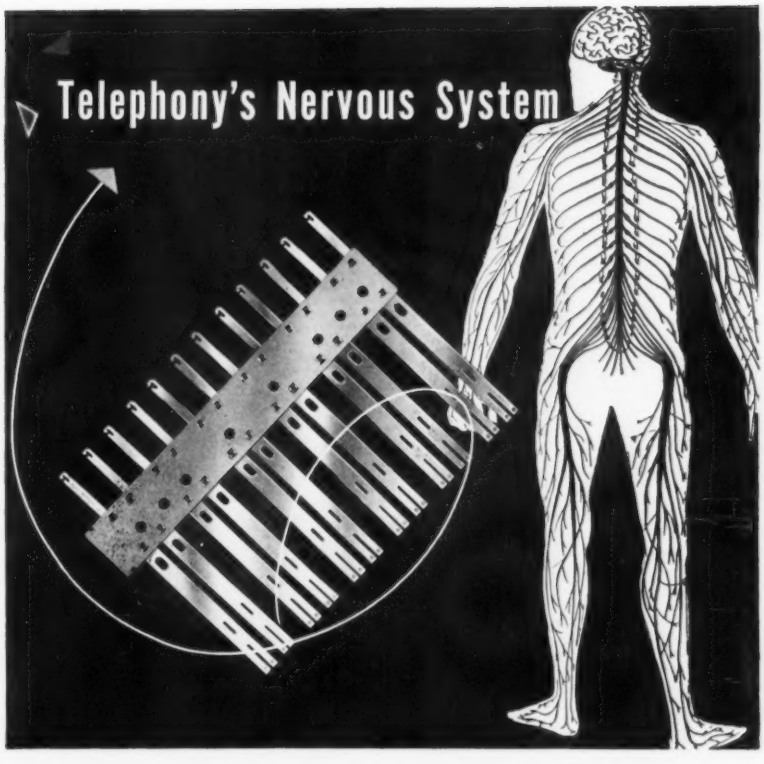
Tin

Rumors that exports of tin would be regulated in 1958, under the International Tin Agreement, lent some strength to the market. The steady drop in the New York price halted.

However, traders don't expect an upward move. Outlook is for fluctuation around 88¢ to 90¢ per lb into 1958.

Tin prices for the week: Nov. 13 — 89.875; Nov. 14 — 89.75; Nov. 15—89.875; Nov. 18—89.750; Nov. 19—89.625.*

*Estimate.



. . . relies on "neurons" of Seymour Nickel Silver

Dial telephones carry your voice to the ends of the earth through an intricate electrical network which closely resembles the human nervous system. Seymour nickel silver plays a key role in modern communications as part of the North Electric Company "Crossbar Switching System" which automates independent telephone exchanges.

Tiny, neuron-like contacts on North Crossbar switch assemblies rely on flat springs of even-tempered Seymour nickel silver for *trillions* of "makes-and-breaks".

Easy to work, corrosion-resistant and possessing excellent conductivity, Seymour nickel silver has an enviable reputation for quality and uniformity among hundreds of manufacturers who say: — "Specify SEYMOUR. You KNOW it's good!"

Perhaps Seymour metallurgists can help solve your materials problems. Tell us your requirements.

Long distance telephone operators link distant points to the North Crossbar System in Seymour, Indiana.

THE SEYMOUR MANUFACTURING COMPANY
2 FRANKLIN STREET
SEYMOUR, CONNECTICUT

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate
("F" temper except 6061-0)

Alloy	032	081	136-249	250-3
1100, 3003	46 6	44 3	43 6	42 7
5052	54 0	48 9	47 2	45 4
6061-0	51 4	47 0	45 2	45 1

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-8	45 0-46 8	60 4-64 1
12-14	45 7-47 2	61 3-65 8
24-26	49 0-49 5	72 1-76 8
36-38	58 0-58 6	96 2-99 8

Screw Machine Stock—2011-T-3

Size*	¼	⅝-⅞	1	1¼-1½
Price	63 0	62 5	61 0	58 6

Roofing Sheet, Corrugated
(Per sheet, 26" wide base, 16,000 lb)

Length* →	72	96	120	144
.019 gage	$1 420	$1 893	$2 367	$2 839
.024 gage	1 774	2 366	2 957	3 549

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type ↓ Gage →	250 3 00	250 2 00	188	081	032
AZ31B Stand. Grade		67 9	69 0	77 9	108 1
AZ31B Spec.		93 3	95 7	108 7	171 3
Tread Plate		70 6	71 7		
Tooling Plate	73 0				

Extruded Shapes

factor →	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	69 6	70 7	75 6	89 2
Spec. Grade (AZ31B)	84 6	85 7	90 6	104 2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	126	106	128
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube	157	129	200
Shot, blocks		87	

COPPER, BRASS, BRONZE

(Freight included on 5000 lbs)

	Sheet	Wire	Red	Tube
Copper	50 13		47 36	50 32
Brass, 70/30	44 02	44 56	45 26	46 93
Brass, Low	46 50	47 04	46 44	49 31
Brass, R L	47 37	47 91	47 31	50 18
Brass, Naval	48 27		42 58	51 68
Munts Metal	46 39		42 20	
Comm. Bs.	48 78	49 32	48 72	51 34
Mang. Bs.	52 01		46 11	
Phos. Bs. 5%	69 07		69 57	

Free Cutting Brass Rod 32.30

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $9.50-$10.60; alloy, $14.75; Plate, HR, commercially pure, $8.00-$8.75; alloy, $10.75. Wire, rolled and/or drawn, commercially pure, $7.50-$8.00; alloy $10.00; Bar, HR or forged, commercially pure, $6.15-$6.40; alloy, $6.15-$6.35; billets, HR, commercially pure, $6.00-$6.25; alloy, $6.00-$6.20.

PRIMARY METAL

(Cents per lb, unless otherwise noted)

Antimony, American, Laredo, Tex... 33.50
Beryllium aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium del'd ..... $ 1.70
Calcium, 99.9%, small lots ..... $ 4.55
Chromium, 99.8% metallic basis ... $ 1.31
Cobalt, 97-99% (per lb) ....$2.00 to $2.07
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 39.50 to 53.50
Gold, U. S. Treas., per troy oz. $35.00
Indium, 99.9%, dollars per troy oz... $ 2.25
Iridium, dollars per troy oz. ... $86 to $89
Lithium, 98% ..... $11.00 to $14.00
Magnesium, sticks, 100 to 500 lb 59.00
Mercury, dollars per 76-lb flask f.o.b. New York ..... $228 to $231
Nickel oxide sinter at Copper Cliff, Ont., contained nickel 71.25
Palladium, dollars per troy oz... $23 to $24
Platinum, dollars per troy oz... $82 to $87
Rhodium ..... $120.00 to $125.00
Silver, mills (c per troy oz.) 90.375
Thorium, per kg. $43.00
Uranium, normal per kg. $40.00
Vanadium ..... $ 3.45
Zirconium sponge $10.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
No. 115 ..... 27.25
No. 120 ..... 26.25
No. 123 ..... 25.50
80-10-10 ingot
No. 305 ..... 31.25
No. 315 ..... 29.25
88-10-2 ingot
No. 210 ..... 38.25
No. 215 ..... 34.00
No. 245 ..... 30.75
Yellow ingot
No. 405 ..... 22.75
Manganese bronze
No. 421 ..... 24.50

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper max. 25.25-26.00
0.60 copper max. 25.00-25.75
Piston alloys (No. 122 type)..24.25-25.00
No. 12 alum. (No. 2 grade) ...22.00-23.00
108 alloy 22.25-23.00
195 alloy 25.25-26.75
13 alloy (0.60 copper max.)...25.00-25.75
AXS-679 ..... 22.25-23.00

(Effective Nov. 18, 1957)

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97½% 23.00-24.00
Grade 2—92-95% 21.75-22.50
Grade 3—90-92% 20.50-21.50
Grade 4—85-90% 18.25-19.25

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1c per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	23	22¼
Yellow brass	17⅜	15¾
Red brass	20¼	19½
Comm. bronze	21	20¼
Mang. bronze	16⅛	15⅜
Yellow brass rod ends	17⅛	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 21¼
No. 2 copper wire 19¼
Light copper 17½
*Refinery brass 19½
Copper bearing material 19
*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 21¼
No. 2 copper wire 19¼
Light copper 17½
No. 1 composition 19¼
No. 1 comp. turnings 18¼
Hvy. yellow brass solids 13
Brass pipe 15½
Radiators 15¼

Aluminum

Mixed old cast ..... 13 —14
Mixed new clips ..... 15½—16½
Mixed turnings, dry ..... 13½—14½

Dealers' Scrap

Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 19 —19⅛
No. 2 copper wire ..... 17 —17½
Light copper ..... 15½—16
Auto radiators (unsweated).. 11¾—12
No. 1 composition ..... 15½—16
No. 1 composition turnings... 15 —15⅛
Cocks and faucets ..... 12 —12⅛
Clean heavy yellow brass.... 11 —11⅛
Brass pipe ..... 12½—13
New soft brass clippings .... 13 —13⅛
No. 1 brass rod turnings .... 11¼—11¾

Aluminum

Alum. pistons and struts .... 5½— 6
Aluminum crankcases ..... 10½—11
1100 (2S) aluminum clippings 14 —14⅛
Old sheet and utensils ..... 10½—11
Borings and turnings ..... 6½— 7
Industrial castings ..... 10½—11
2024 (24S) clippings ..... 12 —12⅛

Zinc

New zinc clippings ..... 4 — 4⅛
Old zinc ..... 3 — 3⅛
Zinc routings ..... 1⅞— 2
Old die cast scrap ..... 1½— 1¾

Nickel and Monel

Pure nickel clippings 50-55
Clean nickel turnings 45-50
Nickel anodes 50-55
Nickel rod ends 50-55
New Monel clippings 33-35
Clean Monel turnings 22-25
Old sheet Monel 30-33
Nickel silver clippings, mixed. 20
Nickel silver turnings, mixed. 17

Lead

Soft scrap lead ..... 8½— 9
Battery plates (dry) ..... 4 — 4¼
Batteries, acid free ..... 2¾— 3

Miscellaneous

Block tin ..... 75 —76
No. 1 pewter ..... 55 —60
Auto babbitt ..... 35 —40
Mixed common babbitt ..... 11 —11½
Solder joints ..... 15 —15½
Siphon tops 42
Small foundry type ..... 12½—12¾
Monotype ..... 12½—12¾
Linc and stereotype ..... 11½—11¾
Electrotype ..... 10½—10¾
Hand picked type shells ..... 7½— 8
Linc and stereo dross ..... 3½— 3¾
Electro dross ..... 2¼— 3

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$114.00 *B3*		5.325 *B3*	7.80 *B3*	5.325 *B3*						
	Buffalo, N. Y.	$77.50 *R3, B3*	$96.00 *R3, B3*	$114.00 *R3, B3*	6.225 *B3*	5.325 *B3*	7.80 *B3*	5.325 *B3*	4.925 *R3, B3*	7.15 *S10*	7.325 *B3*			
	Phila., Pa.									7.70 *P15*				
	Harrison, N. J.													15.05 *C11*
	Conshohocken, Pa.		$101.00 *A2*	$121.00 *A2*					4.975 *A2*	7.20 *A2*	7.325 *A2*			
	New Bedford, Mass.									7.60 *R6*				
	Johnstown, Pa.	$77.50 *B3*	$96.00 *B3*	$114.00 *B3*		5.325 *B3*	7.80 *B3*							
	Boston, Mass.									7.70 *T8*				15.40 *T8*
	New Haven, Conn.									7.60 *D1*				
	Baltimore, Md.									7.15 *T8*				
	Phoenixville, Pa.					5.325 *P2*		5.325 *P2*						
	Sparrows Pt., Md.								4.925 *B3*		7.325 *B3*			
	Bridgeport, Wallingford, Conn.	$80.50 *N8*	$101.00 *N8*	$114.00 *N8*						7.60 *W1*				
	Pawtucket, R. I. Worcester, Mass.									7.70 *N7* 7.70 *A5*				15.40 *N7* 15.20 *T8*
MIDDLE WEST	Alton, Ill.								5.125 *L1*					
	Ashland, Ky.								4.925 *A7*					
	Canton-Massillon, Dover, Ohio		$96.00 *R3*	$114.00 *R3, T5*						7.15 *G4*		10.45 *G4*		14.85 *C11*
	Chicago, Ill. Franklin Park, Ill. Evanston, Ill.	$77.50 *U1, R3*	$96.00 *U1, R3,W8*	$114.00 *U1, R3,W8*	6.225 *U1*	5.275 *U1, W8,P13*	7.75 *U1,Y1 W8*	5.275 *U1*	4.925 *W8, N4,A1*	7.25 *A1,T8 M8*			8.10 *W8, S9,I3*	15.05 *A1, S9,G4*
	Cleveland, Ohio									7.15 *A5,J3*		10.45 *A5*	8.10 *J3*	
	Detroit, Mich.			$114.00 *R5*					5.025 *G3, M2*	7.25 *M2,D1, D2,G3,P11*	7.425 *G3*	10.60 *D2* 10.55 *G3*	8.10 *G3*	
	Anderson, Ind.									7.15 *G4*				
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$77.50 *U1*	$96.00 *U1*	$114.00 *U1, Y1*		5.275 *U1, I3*	7.75 *U1, I3*	5.275 *I3*	4.925 *U1, I3,Y1*	7.15 *Y1*	7.325 *U1, I3,Y1*	10.60 *Y1*	8.10 *U1, Y1*	
	Sterling, Ill.	$77.50 *N4*				5.275 *N4*			5.025 *N4*					
	Indianapolis, Ind.									7.30 *J3*				15.20 *J3*
	Newport, Ky.												8.10 *A9*	
	Middletown, Ohio													
	Niles, Warren, Ohio Sharon, Pa.		$96.00 *S1, C10*	$114.00 *C10,S1*					4.925 *R3, S1*	7.15 *R3,T4 S1*	7.325 *R3, S1*	10.50 *S1* 10.45 *R3*	8.10 *S1*	15.05 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Aliquippa, Pa.	$77.50 *U1, P6*	$96.00 *U1, C11,P6*	$114.00 *U1, C11,B7*	6.225 *U1*	5.275 *U1, J3*	7.75 *U1, J3*	5.275 *U1*	4.925 *P6*	7.15 *J3,B4, S7*			8.10 *S9*	15.05 *S9*
	Weirton, Wheeling, Follansbee, W. Va.				6.225 *W3*	5.275 *W3*			4.925 *W3*	7.15 *W3,F3*	7.325 *W3*	10.50 *W3*		
	Youngstown, Ohio	$77.50 *R3*	$96.00 *Y1, C10*	$114.00 *Y1*			7.75 *Y1*			7.15 *Y1,J3*	7.325 *U1, Y1*	10.65 *Y1*	8.10 *U1, Y1*	15.05 *J3* 10.65 *Y1*
WEST	Fontana, Cal.	$88.00 *K1*	$105.50 *K1*	$135.00 *K1*		6.075 *K1*	8.55 *K1*	6.225 *K1*	5.825 *K1*	9.00 *K1*				
	Geneva Utah		$96.00 *C7*			5.275 *C7*	7.75 *C7*							
	Kansas City, Mo.					5.375 *S2*	7.85 *S2*						8.35 *S2*	
	Los Angeles, Torrance, Cal.		$105.50 *B2*	$134.00 *B2*		5.975 *C7, B2*	8.45 *B2*		5.675 *C7, B2*	9.05 *J3*			9.30 *B2*	17.25 *J3*
	Minnequa, Colo.					5.575 *C6*			6.025 *C6*	9.10 *K1*				
	Portland, Ore.					6.025 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$105.50 *B2*			5.925 *B2*	8.40 *B2*		5.675 *C7, B2*					
	Seattle, Wash.		$109.50 *B2*			6.025 *B2*	8.50 *B2*		5.925 *B2*					
SOUTH	Atlanta, Ga.					5.475 *A8*			5.125 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$77.50 *T2*	$96.00 *T2*			5.275 *T2, R3,C16*	7.75 *T2*		4.925 *T2, R3,C16*		7.325 *T2*			
	Houston, Lone Star, Texas		$101.00 *S2*	$119.00 *S2*		5.375 *S2*	7.85 *S2*						8.35 *S2*	

(Effective Nov. 18, 1957)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		BLACK PLATE
		Hot rolled 18 ga. & hvyr.	Cold rolled	Galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* 1.25 lb. base box	Electro* 0.25 lb. base box	Holloware Enameling 29 ga.
EAST	Bethlehem, Pa.												
	Buffalo, N. Y.	4.925 *B3*	6.05 *B3*				7.275 *B3*	8.975 *B3*		6.15 *W6*			
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	4.975 *A2*	6.10 *A2*				7.325 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.15 *B3*			
	Fairless, Pa.	4.975 *U1*	6.10 *U1*				7.325 *U1*	9.025 *U1*			$10.15 *U1*	$8.85 *U1*	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	4.925 *B3*	6.05 *B3*	6.60 *B3*			7.275 *B3*	8.975 *B3*	9.725 *B3*	6.25 *B3*	$10.15 *B3*	$8.85 *B3*	
	Worcester, Mass.									6.45 *A5*			
	Trenton, N. J.												
MIDDLE WEST	Alton, Ill.									6.35 *L1*			
	Ashland, Ky	4.925 *A7*		6.60 *A7*	6.625 *A7*								
	Canton-Massillon, Dover, Ohio			6.60 *R3, R1*									
	Chicago, Joliet, Ill.	4.925 *W8, A1*					7.275 *U1*			6.15 *A5, R3, W8, N4, K2*			
	Sterling, Ill.									6.25 *N4, K2*			
	Cleveland, Ohio	4.925 *R3, J3*	6.05 *R3, J3*		6.625 *R3*		7.275 *R3, J3*	8.975 *R3, J3*		6.15 *A5*			
	Detroit, Mich.	5.025 *G3, M2*	6.15 *G3* 6.05 *M2*				7.375 *G3*	9.075 *G3*					
	Newport, Ky	4.925 *A1*	6.05 *A1*										
	Gary, Ind. Harbor, Indiana	4.925 *U1, I3, Y1*	6.05 *U1, I3, Y1*	6.60 *U1, I3*	6.625 *U1, I3, Y1*	7.00 *U1*	7.275 *U1, Y1, I3*	8.975 *U1, Y1*		6.15 *Y1*	$10.05 *U1, Y1*	$8.75 *I3, U1, Y1*	7.50 *U1, Y1*
	Granite City, Ill.	5.125 *G2*	6.25 *G2*	6.80 *G2*	6.825 *G2*							$8.85 *G2*	7.60 *G2*
	Kokomo, Ind.			6.70 *C9*						6.25 *C9*			
	Mansfield, Ohio		6.05 *E2*			7.00 *E2*							
	Middletown, Ohio		6.05 *A7*	6.60 *A7*	6.625 *A7*	7.00 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	4.925 *R3, N3, S1*	6.05 *R3*	6.60 *R3*	6.625 *N3, S1*	7.00 *N3, S1, R3*	7.275 *R3*	8.975 *S1, R3*				$8.75 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Donora, Pa. Aliquippa, Pa.	4.925 *U1, J3, P6*	6.05 *U1, J3, P6*	6.60 *U1, J3*	6.625 *U1*		7.275 *U1, J3*	8.975 *U1, J3*	9.725 *U1*	6.15 *A5, J3, P6*	$10.05 *U1, J3*	$8.75 *U1, J3*	7.50 *U1, J3*
	Portsmouth, Ohio	4.925 *P7*	6.05 *P7*							6.15 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.925 *W3, W5*	6.05 *W3, F3, W5*	6.60 *W3, W5*		7.00 *W3, W5*	7.275 *W3*	8.975 *W3*			$10.05 *W3, W5*	$8.75 *W3, W5*	7.50 *W5*
	Youngstown, Ohio	4.925 *U1, Y1*	6.05 *Y1*		6.625 *Y1*		7.275 *Y1*	8.975 *Y1*		6.15 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.30 *K1*				8.175 *K1*	10.275 *K1*			$10.80 *K1*	$9.50 *K1*	
	Geneva, Utah	5.025 *C7*											
	Kansas City, Mo.									6.40 *S2*			
	Los Angeles, Torrance, Cal.									6.95 *B2*			
	Minnequa, Colo.									6.40 *C6*			
	San Francisco, Niles, Pittsburgh, Cal.	5.625 *C7*	7.00 *C7*	7.35 *C7*						6.95 *C7*	$10.80 *C7*	$9.50 *C7*	
	Seattle, Wash.												
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	4.925 *T2, R3*	6.05 *T2, R3*	6.60 *T2, R3*						6.15 *T2, R3*	$10.15 *T2*	$8.85 *T2*	
	Houston, Tex.									6.40 *S2*			

† Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box.

* COKES: 1.50-lb. add 25¢.

ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb. 0.25 lb. add 65¢.

(Effective Nov. 18, 1957)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfrs'. Bright
EAST	Bethlehem, Pa.				6.475 *B3*	8.775 *B3*	7.925 *B3*					
	Buffalo, N. Y.	5.425 *R3,B3*	5.425 *R3,B3*	7.35 *B5*	6.475 *B3,R3*	8.775 *B3,B5*	7.925 *B3*	5.10 *B3*		7.20 *B3*		7.65 *W6*
	Claymont, Del.							5.10 *C4*		7.20 *C4*	7.625 *C4*	
	Coatesville, Pa.							5.10 *L4*		7.20 *L4*	7.925 *L4*	
	Conshohocken, Pa.							5.20 *A2*	6.175 *A2*	7.20 *A2*	7.625 *A2*	
	Harrisburg, Pa.							5.80 *P2*	6.275 *P2*			
	Milton, Pa.	5.575 *M7*	5.575 *M7*									
	Hartford, Conn.			7.80 *R3*		9.075 *R3*	7.925 *B3*					
	Johnstown, Pa.	5.425 *B3*	5.425 *B3*		6.475 *B3*			5.10 *B3*		7.20 *B3*	7.625 *B3*	7.65 *B3*
	Fairless, Pa.	5.575 *U1*	5.575 *U1*		6.625 *U1*							
	Newark, N. J. Camden, N. J.			7.75 *W10* 7.75 *P10*		8.95 *W10* 8.95 *P10*						
	Bridgeport, Conn. Putnam, Conn. Willimantic, Conn.	5.65 *N8*	5.65 *N8*	7.65 *N8* 7.85 *W10* 7.80 *J3*	6.55 *N8*	8.925 *N8*						
	Sparrows Pt., Md.		5.425 *B3*					5.10 *B3*		7.20 *B3*	7.625 *B3*	7.75 *B3*
	Palmer, Worcester, Readville, Mass. Mansfield, Mass.			7.85 *B5,C14*		9.075 *A5,B5*						7.95 *A5, W6*
	Spring City, Pa.			7.75 *K4*		8.95 *K4*						
MIDDLE WEST	Alton, Ill.	5.625 *L1*										7.85 *L1*
	Ashland, Newport, Ky.							5.10 *A7,A1*		7.20 *A1*		
	Canton, Massillon, Ohio			7.30 *R3,R2*	6.475 *R3,T5*	8.775 *R3,R2, T5*						
	Chicago, Joliet, Waukegan, Ill. Harvey, Ill.	5.425 *U1,R3, W8,N4,P13*	5.425 *U1,R3, N4,P13*	7.30 *A5, W10,W8 B5,L2,N9*	6.475 *U1,R3, W8*	8.775 *A5, W10,W8 L2,N8,B5*	7.925 *U1,W8*	5.10 *U1,A1, W8,I3*	6.175 *U1*	7.20 *U1,W8*	7.625 *U1,W8*	7.65 *A5,R3, W8,N4, K2,W7*
	Cleveland, Ohio	5.425 *R3*	5.425 *R3*	7.30 *A5,C13*		8.775 *A5, C13*	7.925 *R3*	5.20 *R3,J3*	6.175 *J3*		7.625 *R3, J3*	7.65 *A5, C13*
	Detroit, Mich.	5.525 *G3*	5.775 *G3*	7.30 *P5* 7.50 *P8,B5*	6.475 *R5* 6.575 *G3*	8.775 *R5* 8.975 *B5,P3, P8*	8.025 *G3*	5.20 *G3*		7.35 *G3*		
	Duluth, Minn.											7.65 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.425 *U1,I3, Y1*	5.425 *U1,I3, Y1*	7.30 *R3,J3*	6.475 *U1,I3, Y1*	8.775 *R3,M4*	7.925 *U1, Y1*	5.10 *U1,I3, Y1*	6.175 *J3,I3*	7.20 *U1,Y1*	7.625 *U1, Y1,I3*	7.75 *M4*
	Granite City, Ill.							5.30 *G2*				
	Kokomo, Ind											7.75 *C9*
	Sterling, Ill.	5.525 *N4*	5.525 *N4*					5.10 *N4*				7.75 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.30 *C10*	6.475 *C10,S1*	8.775 *C10*	7.925 *S1*	5.10 *R3,S1*		7.20 *S1*	7.625 *R3, S1*	
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.425 *U1,J3*	5.425 *U1,J3*	7.30 *A5,B4, R3,J3,C11, W10,S9,C8*	6.475 *U1,J3, C11,B7*	8.775 *A5, W10,R3,S9, C11,C8*	7.925 *U1,J3*	5.10 *U1,J3*	6.175 *U1*	7.20 *U1,J3, B7*	7.625 *U1,J3, B7*	7.65 *A5, J3,P6*
	Portsmouth, Ohio											7.65 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.10 *W5*				
	Youngstown, Ohio	5.425 *U1,R3, Y1*	5.425 *U1,R3, Y1*	7.30 *A5,Y1, F2*	6.475 *U1,Y1*	8.775 *Y1,F2*	7.925 *U1,Y1*	5.10 *U1,R3, Y1*		7.20 *Y1*	7.625 *U1, R3,Y1*	7.65 *Y1*
WEST	Emeryville, Cal. Fontana, Cal.	6.175 *J5* 6.125 *K1*	6.175 *J5* 6.125 *K1*		7.525 *K1*		8.625 *K1*	5.90 *K1*		8.00 *K1*	8.425 *K1*	
	Geneva, Utah							5.10 *C7*			7.625 *C7*	
	Kansas City, Mo.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*					7.90 *S2*
	Los Angeles, Torrance, Cal.	6.125 *C7,B2*	6.125 *C7,B2*	8.75 *R3,P14*	7.525 *B2*	10.65 *P14*	8.625 *B2*					8.60 *B2*
	Minnequa, Colo.	5.875 *C6*	5.875 *C6*					5.95 *C6*				7.90 *C6*
	Portland, Ore.	6.175 *O2*	6.175 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.125 *C7* 6.175 *B2*	6.125 *C7* 6.175 *B2*				8.675 *B2*					8.60 *C7,C6*
	Seattle Wash.	6.175 *B2,N6*	6.175 *B2*				8.675 *B2*	6.00 *B2*		8.10 *B2*	8.525 *B2*	
SOUTH	Atlanta, Ga.	5.625 *A8*	5.625 *A8*									7.85 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	5.425 *T2,R3, C16*	5.425 *T2,R3, C16,S11*	7.90 *C16*			7.925 *T2*	5.10 *T2,R3*			7.625 *T2*	7.65 *T2,R3*
	Houston, Ft. Worth, Lone Star, Tex.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*	5.20 *S2* 5.45 *L3*		7.30 *S2*	7.725 *S2*	7.90 *S2*

(Effective Nov. 18, 1957)

† Merchant Quality—Special Quality 35¢ higher.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.

D1 Detroit Steel Corp., Detroit
D2 Dearborn Div., Sharon Steel Corp.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Northeastern Steel Corp., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 J. & L. Steel Co., Stainless Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Burmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	⅛ In.		¼ In.		1 In.		1¼ In.		1½ In.		2 In.		2½ 3 In.		2 In.		2½ In.		3 In.		3½ 4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Youngstown *R3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fontana *K1*	+8.25	+23.5	+5.25	+19.5	+1.75	+15.00	0.75	+14.25	1.25	+13.25	1.75	+12.75	3.25	+13.00								
Pittsburgh *J3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Alton, Ill. *L1*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Sharon *M3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fairless *N2*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Pittsburgh *N1*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Wheeling *W5*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Wheatland *W4*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Youngstown *Y1*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Indiana Harbor *Y1*	4.25	+11.0	7.25	+7.0	10.75	+2.50	13.25	+1.75	13.25	+0.75	14.25	+0.25	15.75	+1.00								
Lorain *N2*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Youngstown *R3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Fairless *N2*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Fontana *K1*	+3.75		0.25		3.25		3.75		4.25		4.75		5.25									
Pittsburgh *J3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Alton, Ill. *L1*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Sharon *M3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Pittsburgh *N1*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Wheeling *W5*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Wheatland *W4*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Youngstown *Y1*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Indiana Harbor *Y1*	8.75	+5.0	12.75	+1.0	15.75	3.50	16.25	2.25	16.75	3.25	17.25	3.75	17.75	2.50								
Lorain *N2*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50

Threads only, buttweld and seamless 2½ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 10¢ per lb.

(Effective Nov. 18, 1957)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.74	T-1
18	4	1	—	5	2.445	T-4
18	4	2	—	—	1.995	T-2
1.5	4	1.5	8	—	1.10	M-1
6	4	3	6	—	1.49	M-3
6	4	2	5	—	1.245	M-2
High-carbon chromium					.925	D-3, D-5
Oil hardened manganese					.475	O-2
Special carbon					.36	W-1
Extra carbon					.36	W-1
Regular carbon					.305	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*A3, J2, L4*) 10 pct	15 pct	20 pct	Sheet (*I2*) 20 pct
Stainless Type	302				37.50
	304	37.95	42.25	46.70	40.00
	316	44.40	49.50	54.50	58.75
	321	40.05	44.60	49.30	47.25
	347	42.40	47.55	52.80	57.00
	405	29.85	33.35	36.85	.....
	410	29.55	33.10	36.70	.....
	430	29.80	33.55	37.25	.....

CR Strip (89) Copper, 10 pct, 2 sides, 40.25; 1 side, 33.95.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.525	6.50	6.975				
Cleveland *R4*							14.75
So. Chicago *R3*				9.75			
Ensley *T2*	5.525	6.50					
Fairfield *T2*		6.50		9.75		6.60	
Gary *U1*	5.525					6.60	
Huntington *C16*		6.50					
Ind. Harbor *I3*	5.525		6.975	9.75		6.60	
Ind. Harbor *Y1*				9.75			
Johnstown *B4*		6.50					
Joliet *U1*			6.975				
Kansas City *S2*				9.75			14.75
Lackawanna *B4*	5.525	6.50	6.975			6.60	
Lebanon *B4*			6.975		14.50		14.75
Minnequa *C6*	5.525	7.00	6.975	9.75		6.60	14.75
Pittsburgh *P5*							14.75
Pittsburgh *J3*				9.75			
Seattle *B2*				10.25		6.75	15.75
Steelton *B3*	5.525		6.975			6.60	
Struthers *Y1*				9.75			
Torrance *C7*						6.75	
Williamsport *S5*		6.50					
Youngstown *R2*				9.75			

COKE

Furnace, beehive (f.o.b.) Connellsville, Pa.	Net-Ton $15.00 to $15.75
Foundry, beehive (f.o.b.)	$17.50 to $19.00
Foundry oven coke	
Buffalo, del'd	$31.75
Detroit, f.o.b.	30.50
New England, del'd	31.55
Kearney, N. J., f.o.b.	29.75
Philadelphia, f.o.b.	29.50
Swedeland, Pa., f.o.b.	29.50
Painesville, Ohio, f.o.b.	30.50
Erie, Pa., f.o.b.	30.50
Cleveland, del'd	32.65
Cincinnati, del'd	31.84
St. Paul, f.o.b.	29.75
St. Louis, f.o.b.	31.50
Birmingham, f.o.b.	28.85
Milwaukee, f.o.b.	30.50
Neville, Is., Pa.	29.25

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1957 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field		9.625	
Armature	11.10	10.85	11.35
Elect.	11.80	11.55	12.05
Hermetic		12.10	
Motor	12.90	12.65	13.15
Dynamo	13.95	13.70	14.20
Trans. 72	15.00	14.75	15.25
Trans. 65	15.55		
		Grain Oriented	
Trans. 58	16.05	Trans. 80	19.20
Trans. 52	17.10	Trans. 73	19.70

Producing points: Beech Bottom (*W5*); Brackenridge (*A5*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*N5*); Niles, O. (*N5*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	Length (In.)	Price	CARBON* Diam. (In.)	Length (In.)	Price
24	84	26.00	40	100, 110	10.70
20	72	25.25	35	110	10.70
18	72	25.75	30	110	10.85
14	72	25.75	24	72 to 84	11.25
12	72	26.25	20	90	11.00
10	60	28.00	17	72	11.40
10	48	28.50	14	72	11.85
7	60	28.25	12	60	12.95
6	60	31.50	10	60	13.00
4	40	35.00	8	60	13.30
3	40	37.00			
2½	30	39.25			
2	24	60.75			

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$135.00
No. 1 Ohio	120.00
Sec. Quality, Pa., Md., Ky., Mo., Ill.	120.00
No. 2 Ohio	103.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $2.00)	21.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$150.00
Childs, Hays, Pa.	155.00
Chicago District	160.00
Western Utah	175.00
California	180.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	157.00-160.00
Silica cement, net ton, bulk, Latrobe	28.50
Silica cement, net ton, bulk, Chicago	25.50
Silica cement, net ton, bulk, Ensley, Ala.	26.50
Silica cement, net ton, bulk, Mt. Union	24.50
Silica cement, net ton, bulk, Utah and Calif.	37.00

Chrome Brick

Per net ton

Standard chemically bonded, Balt.	$105.00
Standard chemically bonded, Curtiner, Calif.	115.00
Burned, Balt.	99.00

Magnesite Brick

Standard Baltimore	$131.00
Chemically bonded, Baltimore	116.00

Grain Magnesite

St. ⅜ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk	$73.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	46.00
in sacks	52.00-54.00

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in: Pa., W. Va., Ohio	$16.75
Midwest	17.00
Missouri Valley	15.00

(Effective Nov. 18, 1957)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢ lb.	Merch. Wire Galv. ¢ lb.
Alabama City *R3*	173	187		212	193	8.65	9.20
Aliquippa *J3****	173	190			190	8.65	9.325
Atlanta *A8***	175	192		214	198	8.75	9.425
Bartonville *K2***	175	192	178	214	198	8.75	9.425**
Buffalo *W6*						8.65	8.95*
Chicago *N4****							
Cleveland *A6*							
Cleveland *A5*						8.65	
Crawf'dav. *M4***	175	192		214	198	8.75	9.425
Donora, Pa. *A5*	173	187		212	193	8.65	9.20
Duluth *A5*	173	187		212	193	8.65	9.20
Fairfield, Ala. *T2*	173	187		212	193	8.65	9.20
Galveston *D4*	9.10‡						
Houston *S2*	178	192		217	198	8.90	9.45
Jacksonville *M4*	184 ‡	197		219	203	9.00	9.675
Johnstown *B3***	173	190	172		196**	8.65	9.325**
Joliet, Ill. *A5*	173	187		212	193	8.65	9.20
Kokomo *C9**	175	189		214	195*	8.75	9.30*
L. Angeles *B2****						9.60	10.275
Kansas City *S2**	178	192		217	198*	8.90	9.45*
Minnequa *C6*†	178	192	177	217	198†	8.90	9.45†
Monessen *P6*					193	8.65	9.20
Palmer, Mass. *W6*						8.95	9.50*
Pittsburg, Cal. *C7*	192	210			213	9.60	10.15
Rankin, Pa. *A5*	173	187			193	8.65	9.20
So. Chicago *R4*	173	187			193	8.65	9.20
S. San Fran. *C6*†				236		9.60	10.15†
Sparrows Pt. *B3****	175			214	198	8.75	9.425
Struthers, O. *Y1**						8.65	9.30
Worcester *A5*	179					8.95	9.50
Williamsport *S5*							

* Zinc less than .10¢.
** 11-12¢ zinc.
*** .10¢ zinc.
† Plus zinc extras.
‡ Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26 0.10	0.41 0.60	0.61 0.80	0.81 1.05	1.06 1.35
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*		10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70		
Detroit *D1*	9.05	10.50	12.70	15.70	
Detroit *D2*	9.05	10.50	12.70		
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60		
Franklin Park, Ill. *T8*	9.05	10.25	12.45	15.45	18.40
Harrison, N. J. *C11*			12.90	16.10	19.30
Indianapolis *J3*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Pittsburgh *S7*	8.95	10.40	12.60	15.60	18.55
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*		10.70	12.90	16.10	19.30
Wallingford *W1*	9.40	10.70	12.90	15.90	18.55
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *J3*	8.95	10.40	12.60	15.60	18.55

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
National Tube	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
Pittsburgh Steel	2	13	36.34	42.56	
	2½	12	48.94	57.31	
	3	12	56.51	66.18	
	3½	11	65.97	77.25	
	4	10	87.61	102.59	

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Pct. Discounts

Machine and Carriage Bolts	Full Container Price	30 Containers	20,000 Lb.	40,000 Lb.
½" and smaller x 6" and shorter	49	54	56	57
⅝" thru 1" x longer than 6"	35	40	43	45
Rolled thread carriage bolts ½" & smaller x 6" and shorter	49	54	56	57
Lag, all diam. x 6" & shorter	49	54	56	57
Lag, all diam. longer than 6 in.	39	44½	47	48½
Plow bolts, ½" and smaller x 6" and shorter	49	54	56	57

(Add 25 pct for broken case quantities)

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
¾ in. or smaller	60½
⅞ in. to 1 in. inclusive	55½
1⅛ in. to 1½ in. inclusive	58½
1⅝ in. and larger	53½
C. P. Hex, reg. & hvy.	
¾ in. and smaller	60½
⅞ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½
Hot Galv. Hex Nuts (All Types)	
¾ in. and smaller	46½
Semi-finished Hex Nuts	
¾ in. or smaller	60½
⅞ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½

(Add 25 pct for broken case or keg quantities)

Finished

⅝ in. and smaller 63

Rivets

Base per 100 lb

½ in. and larger $12.25

Pct. Off List

7/16 in. and smaller 19

Cap Screws

Discount (Packages)

Full Finished H. C. Heat Treat

New std. hex head, packaged

⅜" diam. and smaller x 6" and shorter ..... 40 — 26

½", ⅝", and 1" diam. x 6" and shorter ..... 22 — 3

⅜" diam. and smaller x longer than 6" ..... 8 — +13

½", ⅝", and 1" diam. x longer than 6" ..... + 6 — +32

C-1018 Steel Full-Finished Cartons Bulk

¼" through ⅝" dia. x 6" and shorter ..... 58 — 49

¾" through 1" dia. x 6" and shorter ..... 45 — 33

Minimum quantity—¼" through ⅜" diam., 15,000 pieces; 7/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

Plain Finish		Discount Mach. Screws	Discount Stove Bolts
Cartons		19	32
Bulk	*Quantity*		
To ¾" diam incl.	25,000-200,000	9	54
5/16 to ½" diam incl.	25,000-200,000	9	54
All diam. over 3" long	5,000-100,000	—	54

Machine Screws & Stove Bolt Nuts

	Discount Hex	Discount Square
In Cartons	16	19
Quantity		
In Bulk		
⅝" diam & smaller — 15,000-100,000	7	9

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.7
Chicago	140.9
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 3 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Rolled elliptical, 18 in. or longer, 5000 lb lots	43.50
Electrodeposited	33.25
Brass, 80-20, ball anodes, 2000 lb or more	44.00
Zinc, ball anodes, 2000 lb lots	16.50
(for elliptical add 1¢ per lb)	
Nickel, 99 pct plus, rolled carbon, 5000 lb	1.0225
(Rolled depolarized add 3¢ per lb)	
Cadmium	1.70
Tin, ball anodes and elliptical $1.13 per lb.	

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	74.70
Copper sulphate, 100 lb bags, per cwt.	24.35
Nickel salts, single, 100 lb bags	40.50
Nickel chloride, freight allowed, 300 lb	48.50
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	23.05
(Philadelphia price 23.10)	
Zinc cyanide, 100 lb	60.75
Potassium cyanide, 100 lb drum N. Y.	48.00
Chromic acid, flake type, 10,000 lb or more	31.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots for minus 100 mesh

Swedish sponge iron, del. East of Miss. River, ocean bags, 23,000 lb. and over	10.5¢
F.O.B. Riverton or Camden, New Jersey, freight allowed west of Miss. River	9.5¢
Domestic sponge iron, 98+% Fe, 23,000 lb. and over del'd East of Miss. River	10.5¢
F.O.B. Riverton, New Jersey, West of Miss. River	9.5¢
Canadian sponge iron, del'd in East, carloads	12.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe	57.0¢
Electrolytic iron melting stock, 99.84% pure	27.0¢
Carbonyl iron size 3 to 20 micron, 98% 99.8+% Fe.	88.0¢ to $2.85
Aluminum, freight allowed	38.00¢
Brass, 10 ton lots	31.1¢ to 47.1¢
Copper, electrolytic	41.50¢
Copper, reduced	40.3¢ to 48.8¢
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic, 99.85% min. Fe. 03 max. Del'd	$5.00
Lead	21.50¢ lb, f.o.b. plant
Manganese f.o.b. Extron, Pa.	46.0¢
Molybdenum, 99%	$3.60 to $3.95
Nickel, chemically precipitated	$1.05
Nickel, unannealed	$1.00
Nickel, annealed	$1.06
Nickel, spherical, unannealed #80	$1.13
Silicon	43.50¢
Solder powder	13¢ plus met. value
Stainless steel, 302	$1.02
Stainless steel, 316	$1.30
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	$3.75 (nominal)
Zinc, 5000 lb & over	17.5¢ to 30.7¢

WAREHOUSES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery‡ Charge	Sheets: Hot-Rolled (18 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		8.59	9.87	10.13	8.64	8.97	9.05	9.01	10.68	.....	.....	.....	.....
Baltimore	$.10	8.38	8.98	9.71	8.86	8.76	9.29	9.16	11.44*	16.18	15.18	19.73	18.98
Birmingham	.15	8.18	9.45	10.15	8.23	8.56	8.64	8.60	10.57	.....	.....	.....	.....
Boston	.10	9.48	10.54	11.55	9.52	9.82	9.73	9.83	13.00	15.79	15.38	19.89	19.18
Buffalo	.15	8.40	9.15	11.22	8.65	9.05	9.05	8.95	11.05*	16.34	15.15	19.01	18.95
Chicago	.15	8.35	9.60	10.15	8.38	8.71	8.79	8.75	8.95	15.80	14.80	19.35	18.60
Cincinnati	.15	8.49	9.65	10.20	8.69	9.08	9.33	9.07	9.46	15.61	15.11	18.96	18.91
Cleveland	.15	8.33	9.60	10.10	8.48	8.94	9.16	8.84	10.95*	15.89	14.89	19.44	18.96
Denver	.20	9.70	11.30	12.49	9.80	9.70	9.80	9.98	10.65	.....	.....	.....	17.60
Detroit	.15	8.58	9.85	10.50	8.73	9.06	9.33	9.05	9.30	15.46	15.06	18.81	18.86
Houston		8.45	9.75	.....	8.60	9.05	8.60	8.55	11.10	16.20	.....	19.30	19.05
Kansas City	.20	9.02	10.27	10.07	9.05	9.38	9.46	9.42	9.87	20.02	15.47	20.02	19.27
Los Angeles	.10	10.70	10.85	11.75	9.65	9.65	9.20	9.80	12.60	17.05	16.10	21.05	20.35
Memphis	.15	8.02	9.22	.....	8.12	8.35	8.39	8.25	9.85	.....	.....	.....	.....
Milwaukee	.15	8.48	9.73	10.28	8.51	8.84	9.00	8.88	9.18	15.43	14.93	18.78	18.73
New York	.10	8.97	10.23	10.66	9.41	9.53	9.45	9.67	12.86*	15.02	15.19	18.42	18.99
Norfolk	.20	8.80	.....	.....	8.40	8.35	8.70	8.45	10.70	.....	.....	.....	.....
Philadelphia	.10	8.10	9.00	9.97	8.79	8.87	8.60	8.75	11.61*	15.61	15.11	18.96	18.91
Pittsburgh	.15	8.33	9.60	10.50	8.48	8.71	8.79	8.75	10.95*	15.80	14.80	19.35	18.60
Portland		8.50	11.20	11.55	9.05	8.30	8.65	8.65	14.50	18.50	16.10	20.75	20.25
San Francisco	.10	9.45	10.85	11.10	9.55	9.70	9.60	9.80	13.10	17.05	16.10	21.05	20.35
Seattle		9.95	11.15	12.00	10.00	9.70	9.80	10.80	14.05	16.55	16.35	20.65	20.15
Spokane	.15	10.10	11.30	12.15	10.15	9.85	9.95	10.25	14.20	.....	17.35	21.55	21.05
St. Louis	.15	8.69	9.94	10.51	8.74	9.08	9.25	9.12	9.56	15.66	15.16	19.01	18.96
St. Paul	.15	8.94	10.19	10.76	8.99	9.45	9.53	9.37	9.81	.....	15.26	.....	19.06

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other or with galvanized sheets for quantity.

†† 10¢ zinc. ‡ Deduct for country delivery. † 3/16 in. to ½ in. • C1018—1 in. rounds.

(Effective Nov. 18, 1957)

FERROALLOY PRICES

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	
Birmingham *R3*	62.00	62.50°			
Birmingham *W9*	62.00	62.50°	66.50		
Birmingham *U4*	62.00	62.50°	66.50		
Buffalo *R5*	66.00	66.50	67.00	67.50	
Buffalo *H1*	66.00	66.50	67.00	67.50	
Buffalo *W6*	66.00	66.50	67.00	67.50	
Chester *P2*	66.50	67.00	67.50		
Chicago *I4*	66.00	66.50	66.50	67.00	
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Everett *M6*	67.50	68.00	68.50		
Fontana *K1*	75.00	75.50			
Geneva, Utah *C7*	66.00	66.50			
Granite City *G2*	67.90	68.40	68.90		
Hubbard *Y1*			66.50		
Ironton, Utah *C7*	66.00	66.50			
Midland *C11*	66.00				
Minnequa *C6*	68.00	68.50	69.00		
Monessen *P6*	66.00				
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*		66.50	67.00	67.50	
Sharpsville *S8*	66.00	66.50	66.50	67.00	
So. Chicago *R3*	66.00	66.50	66.50		
So. Chicago *W8*	66.00		66.50	67.00	
Swedeland *A2*	68.00	68.50	69.00	69.50	
Toledo *I4*	66.00	66.50	66.50	67.00	
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	74.00
Youngstown *Y1*			66.50	67.00	

DIFFERENTIALS: Add, 75c per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50c per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31 0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4* (Globe Div.), $78.00; Niagara Falls (15.01 15.50), $101.00; Keokuk (14.01 14.50), $103.50; (15.51 16.00), $106.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.): $61.00. Add $1.00 premium for all grades silver, to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

Base price cents per lb f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.00	23.75	23.25	25.25	—	27.00	39.75	32.25	37.00	—	16.75	—	17.00
Slabs, billets	27.00	27.00	28.00	31.50	32.00	33.25	49.50	40.00	46.50	—	21.50	—	21.75
Billets, forging	—	36.50	37.25	38.00	41.00	40.50	62.25	47.09	55.75	32.00	28.25	28.75	28.75
Bars, struct.	42.00	43.00	44.25	45.00	48.00	47.75	73.00	55.50	64.75	37.75	33.75	34.25	34.25
Plates	44.25	45.00	46.25	47.25	50.00	50.75	76.75	59.75	69.75	40.25	35.00	36.75	36.00
Sheets	48.50	49.25	51.25	52.00	—	55.50	81.50	65.50	79.25	48.25	40.25	—	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50		31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	—	55.50	81.50	65.50	79.25	48.25	40.25	—	40.75
Wire CF; Rod HR	40.00	40.75	42.00	42.75	45.50	45.25	69.25	52.50 52.75	61.50	35.75	32.00	32.50	32.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2*, *J2*, Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R5*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*, Washington, Pa., *W2*, W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*, Detroit, *M2*; Canton-Massillon, O., *R5*; Harrison, N. J., *D3*; Youngstown, *J3*, Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (plus further conversion extras); *W1*; New Bedford, Mass. (25c per lb higher), *R6*; Gary, *U1* (25c per lb higher).

Bar: Baltimore, *A7*, S. Duquesne, Pa., *U1*, Munhall, Pa., *U1*, Reading, Pa., *C2*, Titusville, Pa., *U2*, Washington, Pa., *J2*, McKeesport, Pa., *U1*, *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R5*, S. Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*, *R3*; Ft. Wayne, *I4*; Detroit, *R5*; Gary, *U1*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *I4*, Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen *P1*; Syracuse, *C11*; Bridgeville, *U2*.
Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse *C11*; S. Chicago, *U1*.

Plates: Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C13*; Vandergrift, Pa., *U1*; Gary, *U1*.

Forging billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R5*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*, Syracuse, *C11*; Detroit, *R5*; Munhall, Pa., S. Chicago, *U1*.

(Effective Nov. 18, 1957)

from expert hands to you . . .

DROP FORGINGS Expertly designed and made for maximum strength and toughness. Accurate, flash-free surfaces — smooth, bright, flawless finish. Forged in a wide range of metals and alloys in weights from ¼ to 15 lbs.

COMPLETE MACHINING FACILITIES AVAILABLE

RITCO

● Write Ritco into your plans . . . send blueprints and specifications for prompt estimates at no obligation.

UPSET FORGINGS Accurately produced high strength parts in a wide variety of metals and alloys. Ritco "Bright Finish" Upsets are free of flash, voids and blow holes . . . assure excellent machining qualities.

SPECIAL FASTENERS Ritco maintains complete facilities for making Special Fasteners in any metal or alloy . . . ferrous or non-ferrous . . . ground or unground. Bolts to 2" diameter; studs to 2½" diameter. Cut or precision rolled threads.

RHODE ISLAND TOOL COMPANY

144 WEST RIVER STREET • PROVIDENCE 1, R. I.

Exclusive New England representative for Cleveland Cap Screw Company

Efficient M-3 High Speed Steel
Clark **HOLE-PRODUCING TOOLS**

NEW STEEL WEIGHT FINDER
QUICK - ACCURATE - EASY
Four movable dials quickly give exact

FERROALLOY PRICES

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.

0.02% C	41.00	0.50% C	38.00
0.05% C	39.00	1.00% C	37.75
0.10% C	38.50	1.50% C	37.50
0.20% C	38.25	2.00% C	37.25

4.00-4.50% C, 60-70% Cr, 1-2% Si.. 28.75
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 27.50
0.025% C (Simplex) 36.75
8.00% max C, 50-55% Cr, 3-6% max Si 25.00
8.50% max C, 50-55% Cr, 3% max Si 25.00

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.31
0.50% max. C	1.31
9 to 11% C, 88-91% Cr, 0.75% Fe...	1.40

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅜" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads	$1.29
Ton lots	1.31
Less ton lots	1.33

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in. x down, packed.

Price is sum of contained Cr and contained Si.

	Cr	Si
Carloads	27.50	14.20
Ton lots	32.75	15.65
Less ton lots	34.35	17.30

Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Ca, 60-65% Si, 3.00 max. Fe.

Carloads	25.65
Ton lots	27.95
Less ton lots	29.45

Calcium-Manganese—Silicon

Cents per lb of alloy, lump, delivered, packed.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	24.25
Ton lots	26.15
Less ton lots	27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots	21.15
Less ton lots	22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5: 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots	17.20
Ton lots	18.70
Less ton lots	19.95

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.50
Ton lots to carload packed	19.65
Less ton lots	20.90

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O., Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.25
Johnstown, Pa.	12.25
Sheridan, Pa.	12.25
Philo, Ohio	12.25
S. Duquesne	12.25

Add or substract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	14.80
Ton lots packed	17.20

Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$100.50
19 to 21%	3% max.	102.50
21 to 23%	3% max.	105.00

Manganese Metal

2 in. x down, cents per pound of metal delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	34.00
Ton lots	36.00
250 to 1999 lb	38.00
Premium for Hydrogen - removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn 25.50

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	33.60	36.40	37.60
0.30% max. C	32.10	34.90	36.10
0.50% max. C	31.60	34.40	35.60
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	28.60	31.40	32.60

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carloads bulk	12.80
Ton lots, packed	14.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet	15.10
Ton lots, packed, pallets	16.50

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots, packed	Carloads, packed
96.75% Si, 1.25% Fe..	24.20	22.90
98% Si, 0.75% Fe	24.95	23.65

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk	7.70
Ton lots, packed	10.50

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si	13.00	75% Si	16.40
65% Si	15.25	85% Si	18.10
	90% Si	19.50	

Ferrovanadium

50-55% V delivered, per pound, contained V, carloads, packed.

Openhearth	3.20
Crucible	3.30
High speed steel (Primos)	3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.95	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

(Effective Nov. 18, 1957)

Alsifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	10.65¢
Ton lots	11.80¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.28

Ferrocolumbium, 50-50%, 2 in. x D, delivered per pound contained Cb.

Ton lots	$4.90
Less ton lots	4.95

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Sb plus Ta $4.25

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.68

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton $90.00
10 tons to less carload $110.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $240.00

Ferrotungsten, ¼ x down packed, per pounds contained W, ton lots delivered ..... $2.60 (nominal)

Molybdic oxide, briquets per lb contained Mo, f.o.b. Langeloth, Pa. $1.41
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.38

Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.

Carload, bulk lump	18.50¢
Ton lots, packed lump	20.50¢
Less ton lots	21.00¢

Vanadium oxide, 86-89% V_2O_5 per pound contained V_2O_5 ..... $1.38

Zirconium, per lb of alloy

35-40% f.o.b. freight allowed, carloads, packed	27.25¢
12-15%, del'd lump, bulk-carloads	9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B

2000 lb carload	$5.50

Bortram, f.o.b. Niagara Falls.

Ton lots per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.

Ton lots per pound	14.00¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots, F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up

10 to 14% B	.85
14 to 19%	1.20
19% min. B	1.50

Grainal, f.o.b. Bridgeville, Pa., freight, allowed, 100 lb and over

No. 1	$1.05
No. 79	50¢

Manganese-Boron, 75.00% Mn, 15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots	$1.46
Less ton lots	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots 2.15

RAILWAY
THE CLEARING HOUSE

Clark Hole Mill

Clark Adjustable Spot-Facer & Counterbore

Efficient M-3 High Speed Steel

Clark HOLE-PRODUCING TOOLS

for production jobs on STAINLESS & ALLOY STEELS!

CLARK HOLE MILL—Makes fixed diameter holes fast! One pass in thick stock. Easy starts, curved or irregular surfaces. 1" to 4" sizes; others special.

CLARK ADJUSTABLE SPOT-FACER AND COUNTERBORE—One tool makes many diameters. Easily reground and reset. Heavy cuts in mills, drills, radials, turrets. 1" to 4" sizes; others special.

Write for information on all Clark HOLE-PRODUCING TOOLS!

Robert H. Clark Company

9330 Santa Monica Blvd., Beverly Hills, Calif.

NEW STEEL WEIGHT FINDER

QUICK - ACCURATE - EASY

Four movable dials quickly give exact unit weights of over 1000 steel items including Steel Bars, (Angles, Channels, Flats, Rounds, Squares, & Hexagons), Strip, Sheets (black & galvanized), Structurals, Pipe, Plate (Smooth & Floors), and a Slide Rule for multiplying and dividing. No estimation necessary as answers are shown to 3 & 4 decimals where required. Saves thumbing through weight books & tables. Guaranteed to save time. Indispensable to steel buyers, sellers, fabricators, estimators, engineers, designers, etc.

HANDY COMPACT DURABLE

Shipments prepaid anywhere in U.S. or Canada if order is accompanied by Check or Money Order.

$2.50 EACH Plus Postage

Quantity Prices or Further Details By Writing to

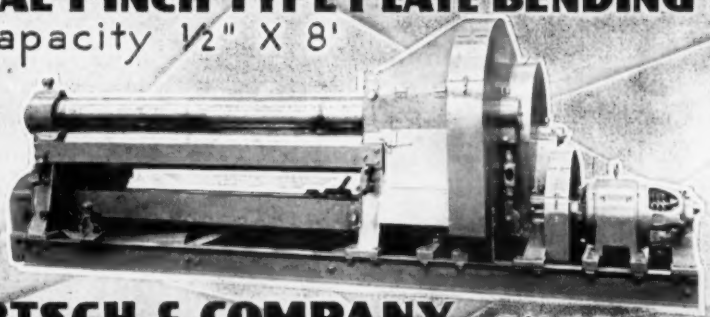
Order From

ALCOTT CALCULATOR COMPANY

DEPT. A P. O. BOX 4606 FORT LAUDERDALE, FLA.

INITIAL PINCH TYPE PLATE BENDING ROLL

Capacity ½" X 8'



Our Line

Light and heavy machinery for all classes of sheet metal, plate and structural work

BERTSCH & COMPANY, CAMBRIDGE CITY • INDIANA

it's the SHAPE that counts!

ALL NEW... Speed-D-Burretts*

Controlled Size and Shape

ABRASIVE MEDIA for PRECISION BARREL FINISHING

4 Shapes to choose from

Outlasts other media as much as 10 to 1

Controlled grain size Aluminum Oxide bonded firmly with specially formulated synthetic rubber to allow finishing of precision parts hitherto impossible to barrel finish. Molded and cured to controlled hardness that assures long life, maximum cushioning yet gives desired cutting, honing or polishing action. May be used with any equipment.

New "Burretts" permit abrasive action in the most remote corners and recesses of delicate, precision parts. Will not chip or splinter into odd shapes that lodge in blind or threaded holes. Prevents broken chip damage to expensive parts.

Write for catalog of prices, sizes, shapes and grits—today!

*Pat. Pend.

SPEED-D-BURR CORPORATION PRECISION BARREL FINISHING

THE WORLD'S MOST COMPLETE LINE OF PRECISION BARREL FINISHING EQUIPMENT & SUPPLIES

Write for catalogs on:

FUTURAMA LINE • MITY-MITE LINE • SPACE-MISER MEDIA AND COMPOUNDS • HANDLING EQUIPMENT

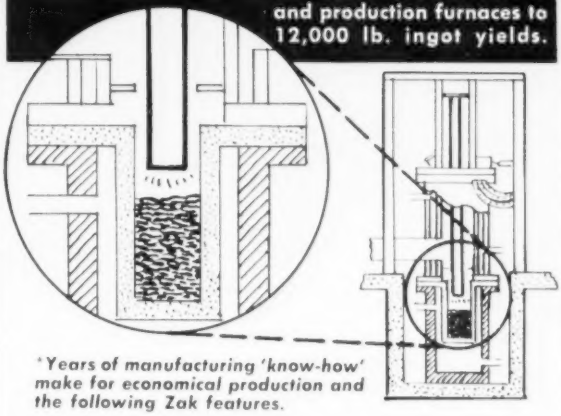
Service is our most important product. Use it!

SPEED-D-BURR CORPORATION

3613-B San Fernando Road, Glendale 4, Calif.

VACUUM ARC RESEARCH FURNACES

and production furnaces to 12,000 lb. ingot yields.



**Years of manufacturing 'know-how' make for economical production and the following Zak features.*

Designed for varying size ingot melts by interchanging crucibles — built in safety and production controls — mechanically guaranteed — vacuum tested in microns and certified at plant. Zak engineers will work with your engineering staff on design and installation.

* No company in the US has a longer vacuum furnace production record. *Will quote to your design.*

ZAK MACHINE WORKS INC.

TROY (GREEN ISLAND) N. Y.

CONSIDER GOOD USED EQUIPMENT FIRST

RAILWAY EQUIPMENT FOR SALE

Used - As Is - Reconditioned

RAILWAY CARS

All Types

SERVICE-TESTED

FREIGHT CAR REPAIR PARTS

For All Types of Cars

LOCOMOTIVES

Diesel, Steam, Gasoline
Diesel-Electric

SPECIAL

STANDARD GAUGE CARS
20 Cupola Caboose Cars
All-Steel Underframe
COVERED HOPPER CARS
10—70-Ton Capacity
ORE HOPPER CARS
660 Cubic Feet
40- and 50-Ton Capacity
SIDE DUMP CARS
6—Air-operated, 30-Cubic Yard, Drop Door
5—Austin-Western 1—Pressed Steel Car

RAILWAY TANK CARS and STORAGE TANKS

6,000- 8,000- and 10,000-Gallon
Cleaned and Tested

CRANES

Overhead and Locomotive

IRON & STEEL PRODUCTS, Inc.

General Office
13496 S. Brainard Ave.
Chicago 33, Illinois
Phone: Mitchell 6-1212

New York Office
50-B Church Street
New York 7, N. Y.
Phone: BEekman 3-8230

"ANYTHING containing IRON or STEEL"

Detroit Looks For Year-End Surge

Used machinery dealers there usually find business good in November and December.

This year die programs of an automaker are expected to be a factor in any pickup.

▪ Varying reports from dealers indicate business is both good and poor—it all depends on who is looking at it and how. In general, however, it can best be described as spotty.

It is apparent, though, that the dealers' attitudes are good. Most look for a general business upturn as the year concludes. Part of this can be explained by several die programs planned by one of the auto manufacturing companies.

Year-End Close-Out — Another explanation is found in a study of seasonal trends over the last few years. November and December have normally been good months for the used machinery market. Customers often approach the end of the year with unexpended funds and prefer to make equipment buys then rather than carry money over into the next year.

Toolroom equipment continues to meet a fairly good reception on the market—if the equipment is good. Grinders, shapers, boring mills and 16, 18 and 20 in. lathes are in demand. Demand also exists for Bridgeport mills, index mills and broaches.

Sheet Equipment Pick-Up — Older equipment has found a steadily diminishing market locally. The old equipment is either sold for scrap or in the South where lower labor costs are the competitive factor for the buyer.

Now that new model auto production is underway, the market for sheet metal equipment has picked up. Auto makers and their suppliers are beginning to farm out some of the work. Sub-contractors find they need newer or additional equipment to remain competitive and get the jobs. Presses, press brakes and shears are selling well. Especially in demand are good 150-200 ton presses with air cushions.

Production equipment is still bleak spot in the business. While there are signs of some slowly growing interest in this equipment, it is not as strong as in other areas. Particularly slow movers are turret lathes and automatic screw machines. Competition for the business, such as it might be, borders on being fierce.

Higher Volume, Lower Price— But there is some evidence that price cutting and good old fashioned digging for customers pays dividends. One dealer reported his business this year should actually surpass the volume of the last two years. "I've cut prices, advertised more heavily, and dug for the customer," he said. "In addition, I carry my own paper and can afford fairly liberal credit to someone with security."

There is also evidence that credit is playing a big part in Detroit sales of used machinery. Dealers report more customers who buy now are asking for longer credit terms—and getting them. Cash customers of a few years back are now looking for 1 to 3 yr. terms,

STEEL PLANT EQUIPMENT

CONSIDER GOOD USED EQUIPMENT FIRST

AIR COMPRESSORS
450 cu. ft. Ingersoll Rand XRE 8" x 8" & 3½" x 8" 100 lb. Pressures, 100 H. P. A. C. Syn. Motor
2700 cu. ft. Ingersoll Rand PRE2, 30" x 18" x 21" 100 lb. Pressures, 500 H.P. Syn. Motor

BENDING ROLLS
10' x 10" Ga. Bertsch Initial Type
10' x ½" King Pyramid Type
16' x ⅝" Ransome Pyramid Type

BRAKE—PRESS TYPE
12' x ½" Cincinnati

CRANES—OVERHEAD ELECTRIC TRAVELING

3 ton P&H	56' Span	220/3/60
5 ton Cleveland	60' Span	115 Volt D.C.
8 ton P&H	55' Span	220/3/60
10 ton Shepard Niles	38' Span	440/3/60
10 ton Shaw	120' Span	230 Volt D.C.
15 ton Shepard Niles	52' Span	230 Volt D.C.
15 ton Shepard Niles	55' Span	220/440 A.C.
15 ton Niles	75' Span	230/3/60
20 ton P&H	55' Span	220/440 A.C.
20 ton MM&M With two 10 ton Trolleys	72' Span	230 Volt D.C.
120 ton Shepard Niles	77' Span	220/3/60

DIEING MACHINE
150 ton Henry & Wright, 3" Stroke, Roll Feed Scrap Cutter, 30 H.P. A.C. Motor

FORGING MACHINES
1" to 5" Acme, Ajax, National

FURNACE—MELTING
15 ton Heroult Top Charge, 12' Shell Complete with Transformers

HAMMERS—BOARD DROP—STEAM DROP—STEAM FORGING
800 lb. to 20,000 lb. incl.

HEADERS
#250C Manville Solid Die Single Stroke
#44 Waterbury Farrel DSOP, Capy. ⅝" x 6"

LEVELLERS—ROLLER
18" Torrington, 15 Rolls 2⅝" dia.
37" Torrington, 19 Rolls 1 31/32", dia.
66" Aetna 17 Rolls 4⅜" dia.

PLANER
72" x 72" x 16' Detrick & Harvey Four Head

PRESSES—HYDRAULIC
250 ton AECo. Straightening 4-Column, 16" Stroke, 67"x35" Between Columns, 16' Long Bed
500 ton HPM Eastraverse, Bed 36"x36"
1500 ton Bliss 12" Stroke, Bed 49"x48"
1500 ton Mesta Steam Hydr. Forging Press
2000 ton Bliss 18" Stroke Bed Area 54"x55"
4500 Baldwin-Lima-Hamilton Hydr. Forging Press

PRESSES—STRAIGHT SIDE
180 ton Hamilton #847, 12" Str. 85½" Bet. Ups.
200 ton Clearing F1200-12, Stroke 30", Bed 44"x38"
250 ton Bliss #88 12" Str. Bed 29" x 29"
250 ton Bliss SI 7½" Str. Bistr. 33" x 39"

PRESSES—KNUCKLE JOINT
600 ton Clearing K-1600-36, 4" stroke, Bed 36"x36"
1500 ton Verson, 4" Stroke, Bed 48"x48"

PUNCH & SHEAR COMBINATIONS
Cleveland Style EF, Arch Jaw Capy 1¼" x 1"
Cleveland Style G Single End, 60" Throat
Cleveland Style W, 60" Throat, Architectural Jaw
#7 Kling, 72" Throat, With Thomas Duplicator

ROLLING MILLS
6" x 5" Torrington Wire Flattening Mill Line
8" x 16" Schmitz Single Stand Two High
10" x 14" Single Stand Two High
10" x 16" Single Stand Two High
12" x 12" Single Stand Two High
12" x 16" Single Stand Two High
16" x 24" Single Stand Two High
20" x 36" Single Stand Two High

ROLL—PLATE STRAIGHTENING
108" Bertsch, Seven Rolls 9" Dia.
72" Niles, 7 Rolls 9" Dia. Motor Driven

ROLLS—ANGLE BENDING
4" x 4" x ⅝" Hercules

SHEAR—ALLIGATOR
No. 4 Mesta RH LK, Capacity 2" x 12"

SHEARS—GATE
6' x 1" Hilles & Jones #6
12' x ⅜" Niagara Model 1212, NEW 1951

SHEAR LINES
36" x .020 Ga. Halldon Shear Line
53" x ⅝" Heavy Duty Shear Line
60 x 7 Ga. Shear Line
96" x 14 Ga. Cleveland Shear Line

SHEARS—SQUARING
6' x 10 Ga. Niagara No. 672
10' x ¼" Cincinnati #1810
10' x ⅝" Cincinnati #3510

SHEARS—ANGLE
6 x 6 x ⅝ Hilles & Jones
4 x 4 x ⅝" Long Allstatter

SLITTERS
24" Yoder Slitting Line
36" Fason Slitting Line

STRAIGHTENERS
No. 3 Medart 3 Roll, Capacity to 4½" Tubing
12 Roll Aetna Standard, Capacity 2¾ O.D.

SWAGING MACHINES
#4 Fenn, Capacity 2¼" Tubing, LATE
#6½A Fenn, Capacity 3⅝" Tube, 1¼" Solid, 16" Die Length Hydraulic Feed, LATE

WIRE MACHINERY
New England Butt Co. 4-Bobbin Planetary cablers Model X-30A, Robbin Size 16" x 19½"
Vaughn Wire Drawing Machine, 4 Blocks 22" Dia Complete elect. equip. for each block

---

Manufacturing • **A. T. HENRY & COMPANY, INC.** • Equipment

50 CHURCH ST., NEW YORK CITY 8
Telephone COrtlandt 7-3427

Confidential Certified Appraisals
Liquidations—Bona Fide Auction Sales Arranged

Consulting Engineering Service
Surplus Mfg. Equipment Inventories Purchased

2000# Chambersburg Pneumatic Forging Hammer, Late Type, Serial 20CH392L7.
4000 lb. Chambersburg Double Frame Steam Forg. Hammer
2500 lb. Erie Single Leg Steam Forg. Hammer
Bliss Trimming Presses Tie Rod Construction Side Shears Capacities 113, 150, 190 tons
United Engineering & Fdry. Alligator Shear Clutch operated; Cap. 6½" Sq.
3—2-ton Denison Auto. Hopper Feed & Index Table Hydr. Multipress
2500 lb. Model E Chambersburg Steam Drop Hammer, New 1944
6' x 10 ga. Cincinnati Squaring Shear
¼" x 8' Pexto Gate Shear; 20" throat
4" National High Duty Upsetting & Forging Machine, air clutch, also one with regular clutch, also 1", 2", 3"
Williams White Bulldozers from 5-ton to 300-ton
Landis Landmaco and other Landis Threading Machines
Single & Double End Punches
No. 3 Motch & Merryweather Saw, with Saw Grinder
No. 3 Waterbury Farrel Progressive Header. Cap. ½"; 4 stations and 1 Cutoff

BOLT, NUT AND RIVET MACHINERY, COLD HEADERS, THREAD ROLLERS, THREADING MACHINES, TAPPERS, COLD BOLT TRIMMERS, SLOTTERS, HOT HEADERS AND TRIMMERS, COLD AND HOT PUNCH NUT MACHINES.

DONAHUE STEEL PRODUCTS CO.
1919 W. 74th Street, Chicago 36, Ill.

REBUILT—GUARANTEED ELECTRICAL EQUIPMENT
SLIP RING MOTORS
Constant Duty—3 phase, 60 cycle

Qu.	H.P.	Make	Type	Volts	R.P.M.
2	2500	Whse.	CW	4600/2300	720
1	2500	G.E.	Mill	2300	240
1	1800	Whse.	Mill	6600/4000	270
2	1800	Whse.	Mill	2200	252
2	500	Al. Ch.	ARY	2300	505
1	500	G.E.	I-M	2300	450
1	400	Al. Ch.	ARY	2200	595
1	400	Whse.	CW	2200	290
1	350	G.E.	I-M-15B	2200	1180
1	350	G.E.	MT-412	2200	480
1	300	Whse.	CW 1012	2200	720
1	250	Al. Ch.	ARY	440	705
1	250	G.E.	MT-414	2200	300
1	200	G.E.	I-M	2200	1760
2	200	G.E.	I-17-M	2200	585
1	200	G.E.	I-14-M	2200	480
1	150	Al. Ch.	ARY	440/220	720
1	150	Whse.	CW	4160/2300	585
1	150	Whse.	CW-1000	440	435
1	100	Whse.	CW	440/220	1160
1	100	El. Dy.	EDX612	2300	900
2	100	G.E.	MT-562	440/220	570
2	100	G.E.	I-15A-M	2300	495
1	100	Al. Ch.	ARY	440	430

SYNCHRONOUS MOTORS
3 Phase, 60 Cycle

Qu.	H.P.	Make	P.F.	Volts	R.P.M.
1	1750	G.E.	100	2200	3600
1	1500	G.E.	80	2400/4160	900
1	1500	Whse.	80	2300	514
1	920	G.E.	80	2200/440	360
1	710	G.E.	80	2300	720
1	450	Whse.	100	2200	124.5
3	350	G.E.	100	2300	900
1	300	G.E.	100	2300	720
1	300	G.E.	80	2200	600
2	300	G.E.	80	440	400
2	250	Whse.	80	440	600
1	200	Al. Ch.	100	2200	514
1	200	Al. Ch.	100	2300	360
1	150	G.E.	100	2200	900
1	150	El. Mchy	80	220	720
1	150	G.E.	100	550	600
3	135	G.E.	80	4000/2200	1200
1	125	G.E.	80	2200	900
2	100	Whse.	80	440/220	1800
1	100	Ideal	80	440/220	900
2	100	G.E.	80	440/220	600
1	100	El. Mchy.	100	440/220	360
2	50	G.E.	80	2200	600

T. B. MAC CABE COMPANY
4302 Clarissa St., Philadelphia 40, Penna.

Cable Address	Phone
"Macsteel" Philadelphia, Pa.	Davenport 4-8300

RE-NU-BILT
GUARANTEED
ELECTRIC POWER EQUIPMENT
A. C. MOTORS
3 phase—60 cycle

SLIP RING

Qu.	H.P.	Make	Type	Volts	Speed
2	1750	G.E.	M-559BS	4800	1800
1	1500	G.E.	MT	6600	1187
1	1100	F.M.	OVZK, B.B.	4800	1800
1	800	G.E.	MT	2300	293
1	750	G.E.	MT-573	2200	1190
1	700	A.C.		2300	500
1	500	Whse.	CW	550	350
1	400	Whse.	CW	440	514
1	350	Cr.Wh.	Size 71	208/416	1765
1	350	G.E.	IM-17A	440/2200	720
1	250	G.E.	MT-424Y	4000	257
1	250	Cr.Wh.	Size 290	2300	350
1	250	Al.Ch.		550	600
1	200	G.E.	IE13 B-M	220/440	1760
1	200	G.E.	MT-557Y	220/440	1760
1	200	Cr.Wh.	200B	440	565
1	200	G.E.	IM	440	435
3	200	G.E.	I-17AM	2200	435
1	200	G.E.	IM	2200	580
1	150	Unused	Whse. CW	2300	435
1	125	A.C.		440	865
1	125	Al.Ch.		440	720
1	100	G.E.	IM-10	2200	435
1	100	G.E.	IM	440	600
4	100	A.C.	ANY	440	695

SQUIRREL CAGE

Qu.	H.P.	Make	Type	Volts	RPM
1	800	G.E.	KT-573	2200	1180
1	650	G.E.	FT-559BY	440	3570
3	500	Whse.	CS-1216	2000	500
2	450	Whse.	CS-1420	2300/4150	354
1	400	G.E.	IK	2200	500
1	300	G.E.	KT-559A	2300	1775
1	200	G.E.	IK-17	440	580
2	200	G.E.	KT-557	440	1809
1	150/75	G.E.	IK	440	900/470
1	150	Whse.	CS8568	440	880
1	150	Whse.	CS	440	580

SYNCHRONOUS

Qu.	H.P.	Make	Type	Volts	RPM
1	7000	G.E.	ATI	2200-6600	600
1	4350	C.W.	3501SL	4000-6900-13800	514
1	2850	Whse.	Sp.f	2300/4600	514
1	2800	Whse.	Sp.f	2300	720
1	2000	Whse.		2300	162
2	1750	G.E.	ATI	2300	3600
1	735	G.E.	ATI	2200/12600	600
1	450	Whse.		2200	128.5
1	295	G.E.	ATI	440	1800
1	225	G.E.	ATI	440	1800
1	100	G.E.	TS-7556	220/440	900

BELYEA COMPANY, Inc.
47 Howell Street, Jersey City 6, N.J.

BENKART STEEL & SUPPLY COMPANY
CORAOPOLIS, PENNSYLVANIA
AMherst 4-1250
Dealers in new and used OET Cranes and Structural Steel Buildings.
Send us your inquiries.

BENNETT MACHINERY CO.
800 TON MILES WHEEL PRESSES
(2) Late Type 800 ton Wheel Presses, 96" between bars; max. dist. ram and resistance head 9'3" wgt. each 65,000 lbs.
(1) 32" Ohio Dreadnaught Shaper, M. D.
375 Allwood Rd., Clifton, New Jersey
Phone: PRescott 9-8996 N. Y. Phone: LOngacre 3-1222

6' x 1" Hilles & Jones Gate Shear, 12" Gap, Motor Driven.
8' x ¼" Niagara Shallow Gap Power Squaring Shear, M.D.

FALK MACHINERY COMPANY
16 Ward St. Baker 5887 Rochester 5, N. Y.

USED MACHINE TOOLS

NEW UNUSED U. S. NAVY SURPLUS

CALL Curry! FOR SURPLUS STEEL PLANT EQUIPMENT

AVAILABLE EQUIPMENT

1—#3½—42" YODER SHEET SLITTER. New 1948. Arbors—6" Diameter. Complete with Entry & Delivery Pinch Rolls. Including 65 Knives (practically NEW) and 150 Spacers. Capacity—4 cuts in ¼" Mild Steel.

1—42" 8—ROLL LEVELLER. Capacity .125" to .250" Gauge. driven by 37½ H.P. Motor—230 Volts DC.

1—48" 17—ROLL LEVELLER. Rolls 4½" Diameter. Capacity .125" Gauge. Driven by 15 H.P. Motor —230 Volts DC.

2—18" & 37" x 36" 4-HI HOT STRIP MILL STANDS. Complete with Rolls, Chocks, Bearings, Spindles, Pinion Stand, Motor-Operated Screwdown, etc.

1—4-STAND TANDEM COLD STRIP MILL. 16" Diameter x 24" Face Rolls. Complete with Electrical Equipment.

13—SHEET LIFTERS Capacity—20,000 Pounds, for Sheet Stacks 48" x 144" x 48" High.

1—40-TON ALLIANCE LADLE CRANE. 15-Ton Auxiliary. Span—60 feet. Electrical Equipment—230 Volts DC.

1—20" & 32" x 110" 3-HI PLATE MILL, with Front and Back Tilting Tables, Mill Run-Out Tables, Leveller, etc., complete.

1—3/16" x 144" STAMCO POWER SQUARING SHEAR. Complete with Helddown.

1—2000 H.P., GENERAL ELECTRIC SLIP RING MOTOR, for 3 Phase, 60 Cycle, 2300 Volt Current @ 237 RPM, with Controls.

1—2000 H.P., MESTA GEAR REDUCTION UNIT. Ratio 10 to 1, @ 25 RPM Output.

1—12" BAR MILL, consisting of 3-Stands 3-Hi 12" Mills. Top & Bottom Screws, Housing Fillings, Bed Plate, Spindles & Coupling Boxes, Pinion Stand and 750 H.P. Motor for 230 Volt DC Current.

1—DOUBLE HEAD GAG PRESS. Sutton Engineering. New 1945. Capacity—1½" Square.

Write for the Curry List of available steel plant equipment

ALBERT Curry & CO. INC.
STEEL PLANT EQUIPMENT
3519 BIGELOW BLVD. • PITTSBURGH 13, PENNA.
Phone MUseum 3-5300

Cable Address: CURMILL-PITTSBURGH

---

eastern Rebuilt Machine Tools

THE SIGN OF QUALITY—THE MARK OF DEPENDABILITY

THREAD MILLING MACHINES
12x 36" Lees-Bradner Universal Type, m.d.
12x 54" Lees-Bradner Universal Type, m.d.
12x102" Lees-Bradner Universal Type, m.d.
14"x16" U6 Automatic Hob, m.d.
No. 40 Lees-Bradner Automatic Universal Type, m.d.
Hall Planetary, m.d.
Model B Hall Planetary, m.d.
Model C Hall Planetary, m.d.
Murchey Planetary, m.d.

VERTICAL MILLING MACHINES
No. 1-14 Kint Owens, m.d.
No. 08 Cincinnati, m.d., latest
54" Ingersoll Two Spindle Rotary Mill, m.d.
No. 40 W. B. Knight, m.d.
No. 4K Kearney & Trecker, "Milwaukee," m.d.
Model B Becker, single pulley drive thru friction drive.
Model 40 Index, m.d.
No. 3VG Reed Prentice Vertical Miller & Die Sinking Machine, m.d.

MANUFACTURING TYPE MILLING MACHINES
No. 0-0 Brown & Sharpe Plain Production, m.d.
No. MM-1-6 U.S. Multi-Miller, m.d.
24" Cincinnati Duplex Automatic, m.d.
No. 21 Brown & Sharpe Automatic, m.d.
48"x16" Newton Slab Miller, m.d.
54"x30"x16" Ingersoll Slab Miller, m.d.
M80 Taylor & Fenn Duplex Spline Miller, m.d., latest type
Model 1402 Kearney & Trecker Simplex, m.d.
No. 33 Simplex Production Miller, m.d.
No. 3A Sundstrand Plain Automatic Rigidmill, m.d.
No. 33H Sundstrand Trimplex Rigidmill, m.d.
3-24" Cincinnati Plain Hydromatic, m.d. in base
3-36 Cincinnati Duplex Hydromatic, m.d. in base
'46-'96 Cincinnati Plain Hydromatic, m.d. in base
No. 28-144 Cincinnati Plain Hydromatic, m.d., late
No. 34-36 Cincinnati Semi-Special Plain Hydromatic, tracer control
No. 12 Brown & Sharpe Plain Horizontal, m.d.
No. 50M Giddings & Lewis H.P. Precision Horizontal, m.d.
No. 14 Production Type, Productomatic, Plain, m.d.
Model 33-1536 Sundstrand Simplex Fluid Screw Type Rigidmill, m.d.

SLOTTERS
10" Newton, m.d.
18" Betts, m.d.
18" Niles-Bement, s.p.d.
20-24" Pattern Drill, m.d.
22" Betts, m.d.
48" Niles, m.d.

We carry an average stock of 2,000 machines in our 11 acre plant at Cincinnati. Visitors welcome at all times.

THE EASTERN MACHINERY COMPANY
1002 Tennessee Avenue, Cincinnati 29, Ohio
MElrose 1241 "TWX" CI 174 CABLE ADDRESS—EMCO

PELS GUILLOTINE SHEAR MOD. EFF35
Will Shear Bars; Flats; Angles; Channel; Tees
WEIDEMANN TURRET PUNCH MOD. 10-B
SEABOARD STEEL CO., Inc., New Haven, Ct.

LATE MODEL SAWS
10" x 10" MARVEL #9A-1, Auto feed, 1952.
18" x 18" MARVEL #18, 24" load track, 1940.
#213 CAMPBELL WET ABRASIVE, 3½" tubes, or 2" rds. 7½ H.P. New 1945.
COMPLETE EQUIPMENT, 3 60 220 440 MOTORS.
WILLIAMS MACHINERY COMPANY
1060 Broad Street Newark 2, N. J.

FOR SALE
COMPLETE BAR & ROD ROLLING MILL IMMEDIATELY AVAILABLE
Suitable for Rolling Steel or Copper billets down to bar or rod sizes, including hotbed, shears, and rod coiler.
STILL SET-UP, REASONABLY PRICED FOR IMMEDIATE SALE
NATIONAL MACHINERY EXCHANGE
126 Mott St. New York 13, N. Y.
CAnal 6-2470

POWER EQUIPMENT CO.
Offers
BARGAIN PRICES ON
GUARANTEED NEW and Rebuilt MOTORS!

NOVEMBER SPECIALS
REBUILT MOTORS

HP	Make	Type	Speed
300	West. Open S.B.	CS-1002	600
200	Cont. TEFCBB		1800
200	Le. TEFCBB	JX-137	1200

Send for our FREE Catalog

Cash for your surplus new & used electric equipment. Send your list today.

Large line of motors, control equipment, AC & DC Generators, MG sets and transformers.

Phone or Wire Us Collect
POWER EQUIPMENT CO.
8 Cairn St., Rochester 2, N. Y.
Phone Genesee 8-5629

H & STEEL SHEET PILING
1500 pcs. BETH. SP-6A—35', 40', 60', & 65'
900 pcs. CARNEGIE M-116—30', 40' & 50'
288 pcs. BETH ZP-32—48" & 62'
317 pcs. BETH. AP-3—20', 28' & 42'
400 pcs. BETH. BP-12—53 lb. 58' to 60'
250 pcs. CARNEGIE MP-112—40' & 60'
300 pcs. BP 14—73 lb. 60'
Stocks: N. Y., New Orleans & Que.

DIESEL LOCOMOTIVES
6-25, 44 & 70 TON GEN. ELECTRIC

3-3078 CFM Air Compressors
3-3078 CFM Ingersoll Rand PRE2 new 1947 & 1942 each equipped 500 HP 3P60C2300V Sym. motor, start panel & MG sets.

R. C. STANHOPE, INC.
60 E. 42nd St. New York 17, N. Y.

MACHINES FOR YOUR YARD
International TD-9 w B-E bulldozer
Bay City 25 dragline w 25' boom
Pioneer 30" x 200' conveyor
Telsmith 4 x 10 d.d. screen
Cedar Rapids 15 x 16 roll crusher
Jeep w Jeep-A-Trencher & BD blade
TRACTOR & EQUIPMENT CO.
10006 Southwest Highway, Oak Lawn, Ill.

UNIVERSAL
MACHINERY & EQUIPMENT CO.

MELTING FURNACES
3 KW AJAX Spark Gap Convertor
20 KW AJAX Melting Unit
50 KW INDUCTION FURNACE
250 lb. LECTROMELT Arc Melting Furnace
1½ Ton LECTROMELT Arc Melting Furnace
1500 lb. HEROULT Arc Melting Furnace

4 Ton Top Charge ELECTRIC FURNACE—Like New

HEAT TREAT FURNACES
1—LEE WILSON 150 KW, 5'6" x 8' I.D. Pit type
1—L & N 25 KW Homecarb Furnace
1—L & N 75 KW, 25" x 48" Electric Pit

CLEANING EQUIPMENT
15" Cont. AMERICAN Tumblast, 4 tons per hour
36" Cont. AMERICAN Tumblast, 15 tons per hour
36 x 42 WHEELABRATOR w skip loader
48 x 42 WHEELABRATOR w skip loader
48 x 48 WHEELABRATOR w skip loader

TENSILE TESTING MACHINES
100,000# TINIUS OLSEN Mechanical Beam Testing
10,000# DETROIT Hydraulic

AMERICA'S LARGEST STOCK OF FOUNDRY EQUIPMENT
1630 N. NINTH ST., READING, PA.
Phone: FRanklin 3-5103

THE CLEARING HOUSE

USED MACHINE TOOLS OF QUALITY

200 KVA Federal No. 70 flash butt welder

50 KW Sciaky Dynatrol automatic cycle press type spot welder

7½" National high duty air clutch upsetting, forging

4" National high duty upsetting, forging, airclutch, new 1944

4" National high duty upsetting, forging, 4 point clutch with air operator

3"-3½" Ajax upsetter steel frame

3" National high duty upsetting, forging, air clutch (2)

1½" National all steel upsetting, forging, hard ways

1" National high duty upsetting, forging, new 1947, air clutch

Economy type R automatic threading, pointing machines (2)

Economy type KK automatic bolt head shaving, pointing machine

38" throat New Doty Mfg. No. 17F single geared single end punching and shearing, MD

36" Rockford openside universal shaper-planer, mechanical, motor drive

10½" x 10½" No. 3 Motch & Merryweather circular cold metal saw, MD

Cleveland cradle type uncoilers, 50"-72" wide, 52" dia., hydraulic

750 ton No. 3 National Maxipress, all steel, forging, air clutch

Write for latest list No. 207.

MILES MACHINERY CO.
PHONE SAGINAW PL 2-3105
2041 E. GENESEE AVE. SAGINAW, MICH.

COMPRESSORS

1902-1957

World's Best Rebuilts

138 CFM 100 psi 7 x 7 Ing. ESI
234 CFM 100 psi 9 x 9 Ing. ESI
268 CFM 500 psi 10-4¾ x 10 Ing. XOB
368 CFM 100 psi 12 x 10 IR-CP-Penn
368 CFM 125 psi 10-6 x 7 Joy WN112B
420 CFM 40 psi 12 x 9 Ing. ES-Oil-Less
465 CFM 100 psi 12 x 11 Penn 3AT Gardner X
528 CFM 100 psi 14 x 12 IR-CP-Penn
585 CFM 100 psi 15-9¾ x 12 IR-XRE 3-60-4160
590 CFM 125 psi 13½ x 8 x 8 Penn DE2
669 CFM 50 psi 15 x 11 Worth. HB or HS
676 CFM 100 psi 15-9¾ x 12 Ing. XRB
686 CFM 100 psi 14 x 13 Worth HB
877 CFM 100 psi 17-10½ x 14 Ing. XRB
1007 CFM 110 psi 19-11 x 12 Chic OCB
2018 CFM Vacuum 26 x 11 Penn 7 AT
7950 CFM 200 psi 33-17¾ x 27 Ing. PRE2 1750 Hp 3-60-2300 3 available
5748 CFM 50 psi 29-29 x 21 Ing.PRE1 3-60-2300
PORTABLES—60-600 CFM Rotary or reciprocating

AMERICAN AIR COMPRESSOR CORP.
DELL & 48TH STREET
NORTH BERGEN, N. J.
Telephone UNion 5-4848

Leveller 17 Roll Backed Up 3" by 30" Fessler.
Leveller 5 Roll 5¼" by 30" Hvy. Duty Fessler.
Grading Mill 6" by 5" Standard. 2 Hi Roller Bg.
Diesel Generator 60 KW 250 V DC Cummins GE.
Compressor 4,000 c. 150 HP Syn Mtr. Torpedo Charger.
MG Set GE 250 KW 250 V DC 720 RPM 375 HP 2300 v.
Tube Bender W&W 1¼ Universal Hyd. 15HP 440v.

F. H. CRAWFORD & COMPANY
30 Church Street New York 7, N. Y.

Excello 56—3 way Boring Machine.
Cinn. 4—48 Hydro Duplex.
Cinn. 10" x 18" Plain Grinder, 1938.
B & S No. 2 Surf. Grinder, Esc. Spin.

D. E. DONY MACHINERY CO.
4357 St. Paul Blvd. Rochester 17, N. Y.

NEW UNUSED U. S. NAVY SURPLUS

AXIAL FLOW FANS

16,000 C.F.M. - 440/3/60 A.C.

Your answer to ventilation problems of fumes; dust; forced draft cooling of machinery boilers, transformers; drying processes; air conditioning. In original crates. Cylindrical in shape, heavily constructed, hot galvanized. Interior primed and varnished; exterior double-primed & weatherproof. 7-blade aluminum propeller. CCW rotation. Navy type model A16-A-4W-6 mfg. by Buffalo Forge. Capacity: 22,500 CFM @ 1" static press., 20,000 CFM @ 2" static press.; 16,000 CFM @ 3" static pressure; other static pressures from curve. Motor: GE type K—5-15 HP—440-3-60—19.2-7.3 amps—1170-1775 RPM—spray-tight enclosure. Dimensions: 37¾" long; 31¼" I.D.; flanged both ends; bolt circle 33¼". Complete with motor; GE 25 HP (max) 440-3-60 controller and spare parts. Can be reconnected for 220 volts AC.

ORIGINAL COST $1950 EACH — OUR PRICE **$750** EACH WHILE THEY LAST

WRITE FOR OTHER SIZES AND VOLTAGES

Also in stock: 230 VDC units @ 35,000 CFM; 20,000 CFM; 16,000 CFM; 10,000 CFM 8000 CFM. Also available at 115 VDC.

ALL FULLY GUARANTEED

Let us send you a sample order. Write for free brochure and fan curve.

The BOSTON METALS Co.

313 E. Baltimore St. - Baltimore 2, Maryland
CUrtis 7-5050 LExington 9-1900

TOTAL OF 17,500-KW IN M.G. SETS

5—3500-KW, 3 Unit, Allis-Chalmers, Motor Generator Sets. Each consisting of:
2—1750-KW, 250/350 Volts parallel, 500/700 Volt series, 514 RPM, 5000 Amp., type HCC, rated continuous at 40 Deg. C. Allis-Chalmers DC Generators with Class B Insulation, separately excited, direct connected in the center to:
1—5000-H, 3730-KW, 13800 Volts (6900 volts), 3 Phase, 60 cycle, 514 RPM. 162 Amps., Allis-Chalmers Synchronous Motor with Class B Insulation, rated continuous at 40 Deg. C. Rise.
Each set equipped with a 40-KW exciter for synchronous motor fields, and a 10-KW exciter for generator fields, both 250-VDC at 514 RPM.
All mounted on a structural steel base approximately 27' long x 11' wide.
These units are of the very latest type and design—condition excellent—were used only a short time—AC and DC Switchgear available. For any additional information and price please contact one of the following dealers closest to you:

T. B. McCabe Company
4300 Clarissa Street, Philadelphia 40, Pa.
Morhead Electrical Machinery Co.
120 Noblestown Road, Oakdale (Pittsburgh District) Pennsylvania
Brazos Engineering Co., Inc.
P. O. Box 9114 Houston, Texas
Duquesne Electric & Mfg. Co.
6428 Hamilton Avenue, Pittsburgh 6, Pa.

WORLD'S LARGEST STOCK

STAMPING PRESSES

SQUARING SHEARS • PRESS BRAKES
REBUILT *and* GUARANTEED

WILL LEASE WITH OPTION TO PURCHASE, OR
WILL FINANCE OVER LONG TERM

JOSEPH HYMAN & SONS
Tioga, Livingston & Almond Sts.
Philadelphia 34, Pa. Phone GArfield 3-8700

Metal Working Plants
Scrap Dealers —

LOGEMANN BALING PRESS

MODEL 114P

Produces bale 24" x 12" x 18". Has press box 100" long x 36" wide x 24" deep. Output 20-30 bundles/hour. Wt. 250#-300# each. Self contained pumping unit mounted on press. Excellent condition. Save 60% on replacement price. Late model. Location: Eastern Seaboard.

Luria Brothers & Co., Inc.
INDUSTRIAL EQUIPMENT DIV.
600 PHILADELPHIA NAT'L BANK BLDG.
PHILA. 5, PA. Phone Rittenhouse 6-7455

#300 Hanchett Vertical Surface Grinder Serial #300-17 capacity 13" x 72".

Cleveland Punch and Shear Model ER-34" throat.

No. 47 Heald Single End Borematic #Serial 4646.

Late Type 4" Bar Sellers Heavy Duty Table Type Horizontal Boring Mill Serial No. 1318.

25" x 96" Landis "C," 1943 Cylindrical Grinder Serial #27527.

Hazard Brownell Machine Tools, Inc.
350 Waterman St. Providence 6, R. I.
Dexter 1-8880

STEEL MILL EQUIPMENT

ROLLING MILLS

10" x 16" Waterbury Farrell 2 Hi, Herringbone Pinions, Herringbone gear drive. Complete and ready to run, 75 H.P., extra rolls.
15" x 30" Garrison, w/10" x 12" vertical rolls, 2 Hi Universal.

ROLLER LEVELLERS

54" x 3/8" McKay, New in 1944, Univ. couplings, gearbox, motor drive, 7 rolls, 7" dia.
60" x 1/4" Aetna Standard, Univ. coupling, gearbox, motor drive, 17 rolls, 4 1/4" dia.
60" x 1/4" Roll & Machine, Univ. couplings, gearbox, motor drive, 17 rolls, 4 1/2" dia.
40" x 22 ga. United w/Flying Shear, 13 rolls 2 1/2" dia., 15" to 62" shear lengths.

STRAIGHTENERS

#2 Sutton, 5 roll type, 3 1/2" rd. solid, 4 5/8" rd. tubes, motor drive.

#0 Sutton, 5 roll type, 1" rd. solid & tubes, motor & controls (2 ea.).

600 Ton Roll & Machine Open End Bar Shear, cap. 5" rd., 4 1/2" sq., steel cut gearing.

42" Morton Draw Cut Flash Trimmer, New in 1946, .078" to .109" stock thickness.

#2 1/2 Yoder Sheet Slitter, new in 1954, cap. 24" x 3 cuts .125" or 7 cuts .094", cutters, spacers, tables, motor & controls.

34" Torrington Slitter with recoiler, 6 cuts .062".

24" Fessler Upcoiler, pinch rolls & coiling rolls.

28" Yoder Rotary Scrap Chopper.

60" x 192" Cincinnati Roll Grinder, crowning attachment, complete with all motors & controls.

36" x 240" Cincinnati Roll Grinder, crowning attachment, filmatic bearings, complete, with all motors & controls.

IN STOCK—IMMEDIATE DELIVERY

LANG MACHINERY CO., INC.

28th St. & A.V.R.R. **Pittsburgh 22, Pa.**

STEEL BARGAINS FOR SALE

Cold Rolled Shearings—Drawing Quality—$50.00 Net Ton

100 Tons—20 gauge x 4"-12" wide x 20"-72" long
50 Tons—19 gauge x 4"-12" wide x 20"-72" long

Cold Rolled Soft Temper

13 Tons—.015 x 37" x Coil—$6.00 cwt.
3 Tons—.015 x 33" x Coil—$6.00 cwt.
8 Tons—.015 x 27" x Coil—$6.00 cwt.
45 Tons—.060 x 15/16" x Coil—$3.75 cwt.

Silicon Steel—Dynamo Grade—Core Plated

20 Tons—.037 x 26 5/8" x 58 3/4"—$3.00 cwt.

Hot Rolled Mild Slab

3 Pieces—6 1/4" thick x 40" x 267"—$3.00 cwt.

Hot Rolled Mild Plate—13/16" Thick

1 Piece —28" x 25 feet—$3.75 cwt.
4 Pieces—29" x 25 feet—$3.75 cwt.
2 Pieces—30" x 25 feet—$3.75 cwt.
4 Pieces—38" x 25 feet—$3.75 cwt.
2 Pieces—55" x 25 feet—$3.75 cwt.

LAFAYETTE STEEL COMPANY

13501 Sanders Avenue, Detroit 17, Michigan

ROLLING MILL

Lease or Sale

20" dia. x 72"-3H. Roughing Stand.
18" dia. x 72"-2H. Roughing Stand with hydraulic lift roller tables.
18"-8" & 5" dia. COLD MILLS. 2H.
4 mills 10" Dia. x 27" FOIL.
DRIVES; 15 to 1500 Hp. 5 to 35/1 Ratio.
FURNACES, Soaking, ferrous & nonferrous, cont. pusher automatic type.
LAB Mills, several stock, 2" to 4" dia. by 4" to 8" long. All 2 rolls high.

NEW HOT & COLD MILLS TO SPECIFICATION

SEABOARD ENGINEERING CO.

767 Springfield Ave., Summit, N. J.
CRestview 3-7317

FOR SALE

Cleveland Model G Punch & Shear 156 Tons Capacity. Complete with 100 punches. Angle Shear Attachment cuts 6" x 1/2". Bar attachment 10" x 1", Punch 2" Diam. through 1" plate.

SINGLETON MACHINE & TOOL CO.
49 Meadow Road Rutherford, New Jersey
Ph. Webster 3-2565

FOUNDRY FOR SALE

Western New York, Grey Iron Foundry. Capacity 22 to 25 tons per day. Now Operating.

ADDRESS BOX G-618
Care The Iron Age, Chestnut & 56th Sts., Phila. 39

FOR SALE

120 ton MORGAN CRANE with 2-60 ton trolleys, 65' span—with 200' runway. Priced right before removal.

ADELPHIA EQUIPMENT CO.
341 North Third St., Phila. 6, Pa.

YODER ROLL FORMING MACHINE

14 Stands; 30 inches between housings; 20 H.P. variable speed motor; 2 1/2" diameter shafts with electrical wiring etc., ready for connecting to auxiliary machines.

VENTO STEEL PRODUCTS CO., INC.

250 Colorado St., Buffalo 15, N. Y.
Phone Fillmore 2211

LIFTING MAGNETS

A complete magnet service. Magnets, new & rebuilt, generators, controllers, reels, etc.

Magnet specialists since 1910

Goodman Electric Machinery Co.
1060 Broad St. Newark 2, N. J.

American Wheelabrator 36 x 42, never been used; 25 cycle, equipped.

ADDRESS BOX G-619
Care The Iron Age, Chestnut & 56th Sts., Phila. 39

if you're feeling very well

or if you're feeling queerly

if it's living you want most

have a checkup yearly

IT'S YOUR BEST CANCER INSURANCE!

American Cancer Society

SHEET MILL EQUIPMENT FOR PROMPT SALE

and immediate delivery

★

MECHANIZED SHEET MILLS

3 High Roughers
2 High Finishing Mills

with Wean Feeders and Catchers Tables and Electrical Equipment

COLD MILLS

2 High Cold Mill Train of 3 Stands with Drive and Electrical Controls

44" ROLL LATHE

★

1400 H.P. MILL MOTOR AND SPEED REDUCER

MESTA SHEET PICKLER

HEAVY DUTY PACK SHEARS

BELL-TYPE ANNEALING FURNACES

Gas Fired and Electric

★

SHEET CARRIER STRADDLE TRUCKS

SHEET ROLLER LEVELERS

PLATE ROLLER LEVELER

HYDRAULIC SHEAR COIL CUT-UP LINE

***NEW* LONG TERNE LINE**

MILL-TYPE AND INDUSTRIAL ELECTRIC MOTORS, SWITCHES AND CONTROLS

These Are Rebuilt and Guaranteed

★

All above is equipment we have operated in our own plants.

THE LOUIS BERKMAN COMPANY

P. O. BOX NO. 671
STEUBENVILLE, OHIO

★

PHONE
Steubenville AT 2-2704

Save on Your INDUSTRIAL TRACK

FOSTER *QUALITY* — FULLY GUARANTEED

RELAYING RAILS

Handle more cars better—cost less to install and maintain. Foster stocks all Rail Sections 12# thru 175#, Switch Material and Track Accessories.

SEND FOR CATALOGS

RAILS · TRACK EQUIPMENT · PIPE · PILING

L. B. FOSTER CO.

PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4
ATLANTA 8 • HOUSTON 2 • LOS ANGELES 5

FOR SALE

50 ton American Diesel Locomotive Crane, new 1944. Caterpillar D-17000 engine. 15 KW Magnet Generator.

65 ton Whitcomb Diesel Elec. Loco. new 1943. Reconditioned. Cummins engines. Like new.

44 ton Whitcomb and Davenport Diesel Elec. Locos. 4 Traction Motors. Heavy Duty. Reconditioned.

50 ton American Guy Derrick. 115' Mast, 100' Boom. Amer. 3-d #140 Hoist & Swinger.

25 ton Davenport Gas-Elec. Loco. New 1946. Reconditioned.

WHISLER EQUIPMENT CO.
1910 Railway Exchange Bldg.
St. Louis 1, Mo.

FOR SALE--

R.R. EQUIPMENT

Immediate Delivery

- **REPAIRED**
- **REBUILT**
- **or "AS IS"**

All work on cars executed in our modern and well-equipped plant at Landisville (Lancaster County), Pennsylvania.

RAIL & INDUSTRIAL EQUIPMENT CO., Inc.

30 Church Street, NEW YORK 7, N. Y. — RR Yard & Shops, LANDISVILLE, PA

MARE

Keep 'em rolling . . . not rusting

FOR SALE

New—Used—Reconditioned railroad freight cars • car parts • locomotives • tank cars • steel storage tanks

MARSHALL RAILWAY EQUIPMENT
Corporation
328 Connell Building, Scranton 3, Pennsylvania
Diamond 3-1117 — Cable MARAILQUIP

FOR SALE

FREIGHT CAR REPAIR PARTS
RELAYING RAILS & ACCESSORIES
STEEL STORAGE TANKS
FRT. CARS & LOCOMOTIVES
CONTRACTOR EQUIP. & MACHINERY

THE PURDY CO.
8754 S. DOBSON AVE.
CHICAGO 19, ILL. — BA 1-2100
ALSO ST. LOUIS, MO., SAN FRAN. AND LONG BEACH, CALIF.

OVERHEAD ELECTRIC TRAVELING CRANE

10 ton capacity P. & H. 3 motor cage operated, 96'-3" span, 230-VDC, 35' lift.

GANTRY CRANE

15 ton capacity P. & H. 3 motor cage operated, 440-V., 3 ph., 60 cy., 45' C. to C. of ground rails, 15' overhang one end, 18' other end, bridge length 78', lift 40'.

Both available for immediate inspection and shipment.

ATTRACTIVELY PRICED

M.E.T. Equipment and Construction Co.
4310 Clarissa Street
Philadelphia 40, Pennsylvania
Phone DA 4-8300

Railroad Freight Cars — Gondola, Box and Flat Cars. Tank Car Tanks — 8000 gallon. Steam Locomotive Crane. Rails.

Consolidated Ry. Equipment Co.
6702 So. Cicero Ave., Chicago 38, Ill.

CRANES

BOUGHT & SOLD

ENGINEERED TO YOUR REQUIREMENTS

Ornitz Equipment Corp.
Industrial Engineering Service
220 3rd Ave. — Brooklyn 17, N. Y.
TRiangle 5-2553

OVERHEAD CRANES & HOISTS

5-ton Northern, 55'4" span, 200/2/60 cy.
7½-ton Shaw, 46'3" span, 230 D. C.
10-ton Shaw, 40'0" span, 220/3/60 cy.
15-ton, P&H, 51'5½" span, 230 D. C.

Many other cranes various spans and currents

JAMES P. ARMEL CO.
711 House Bldg., Pittsburgh, Pa. — Tele: Gr. 1-4449

OFFERING

BRIDGE CRANES

ARNOLD HUGHES COMPANY
2765 Penobscot Bldg. — Detroit, Mich.
WOodward 1-1894

RAILS—All Sections
NEW RELAYING—All Accessories
TRACK EQUIPMENT, FROGS—CROSSINGS—TIE PLATES, CONTRACTORS AND MINE & MINING MACHINERY CARS

M. K. Frank
Grand Central Palace, New York
401 Park Bldg., Pittsburgh, Pa.
106 Lake Street, Reno, Nevada
1209 Metropolitan Bank Bldg., Miami, Fla.

CONTRACT MANUFACTURING

DROP FORGINGS

Special Forgings of Every Description. We solicit your prints or model for quotation.

Wilcox Forging Corporation
Mechanicsburg — Penna.

DROP FORGINGS

Special Forgings—High Quality, Fast Delivery. For prompt attention phone or send prints to John Bello.

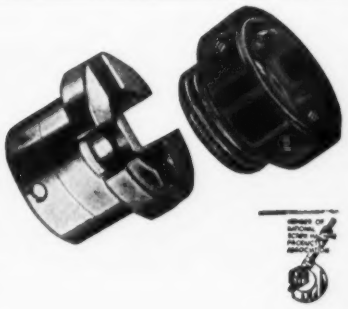
CARCO INDUSTRIES, INC.
7341 Tulip Street, Phila. 35, Pa.
DEvonshire 2-1200

Special Washers

We carry in stock Silicon killed steel specially suited for case-hardening. Stock dies for producing washers from .0015 to ½" thick.

Thomas Smith Company
294 Grove St., Worcester, Mass.

OLSON
SCREW MACHINE PRODUCTS



Made to your specifications and tolerances. From smallest up to 2⅝" diameter in steel, brass and aluminum.

OLSON MANUFACTURING CO.
101 Prescott St., Worcester, Mass.

GEM INSULATING FIREBRICK

★

THE GEM CLAY FORMING CO.
SEBRING, OHIO

MEEHANITE® and NI-HARD CASTINGS
PATTERNS
MACHINE and PLATE SHOP WORK
CUSTOM-BUILT MACHINERY

HARDINGE MANUFACTURING CO.
240 ARCH ST., YORK, PA.

THE FORMULA:

Multi-operation presses
plus
Yankee skilled workmen
over
Eighty years manufacturing
know-how equals
Low cost metal stampings
And precision assemblies
To meet your needs

The GREIST MANUFACTURING CO.
646 Blake St., New Haven 15, Conn.

Nepsco
NEW ENGLAND PRESSED STEEL COMPANY
Contract Manufacturer since 1914
METAL STAMPINGS
SPECIALTIES — APPLIANCES
For Industrial and Domestic Users
P. O. BOX 29
NATICK MASSACHUSETTS

K
SINCE 1895

DROP FORGINGS

Small drop forgings up to one pound in size. Inquiries invited for very prompt action.

KEYSTONE FORGING COMPANY
Northumberland Pennsylvania GReenwood 3-3525

STANDARDIZE WITH
STANDARD

MADE TO YOUR SPECIFICATION
STEEL TUBING
CARBON · ALLOY AND STAINLESS
SEAMLESS OR WELDED
PRESSURE AND MECHANICAL
MILL OR WAREHOUSE QUANTITIES
STANDARD TUBE SALES CORP.
76-01 A...HAVEN BLVD. · BROOKLYN 27, N. Y.

SEND US YOUR BLUEPRINTS
FOR QUOTATION

GRINDING ..... Centerless & Surface Internal & External.
MILLING ..... Light and Heavy Duty.
LAPPING SERVICE.
TURRET LATHE WORK of every description.
PRODUCTION DRILLING & TAPPING Single & Multiple Holes.
Complete Engineering & Production Service

WICACO MACHINE CORPORATION
SINCE 1868
4840 Stenton Avenue
Wayne Junction, Philadelphia 44, Pa.

MEEHANITE® METAL CASTINGS

ROUGH OR MACHINED
ONE TO 60,000 POUNDS
FOR
STRENGTH — ABRASION
CORROSION OR HEAT

ROSEDALE FOUNDRY & MACHINE CO.
1735 PREBLE AVE., PITTSBURGH 33, PA.

PRESS FORGINGS
MERRILL BROS.
5626 ARNOLD AVENUE
MASPETH, QUEENSBORO, N. Y.

DROP FORGINGS
To Your Specifications
Prompt Quotations
BALDT ANCHOR CHAIN & FORGE DIVISION
P. O. Box 350—Chester, Pennsylvania

SPECIAL MACHINERY

DIAMITE *Abrasive Resistant* Castings
NI-RESIST *Heat & Corrosion Resistant* Castings
P M G BRONZE *High Strength Acid Resistant* Castings
Fully Equipped—Pattern Foundry & Machine Shop Facilities——Castings to 15 tons.
Weatherly Foundry & Mfg. Co., Weatherly, Pa.

Let us quote on STAMPINGS and ASSEMBLIES from drawing or sample

Drilling . . . Blanking . . . Riveting . . . Forming . . . Tapping . . . Welding . . . Toolmaking of course

COMPLETE DESIGN AND DEVELOPMENT FACILITIES

HUEBEL MFG. CO., INC.
763 Lexington Ave. Kenilworth, N. J.

EQUIPMENT AND MATERIALS WANTED

WANTED—3000 kva 3 phase stationary electric furnace including bus bars, transformer, control equipment. Primary transformer voltage 13,600, secondary 80 to 300 in 10 volt steps.

ADDRESS BOX G-643
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

WANTED
BRIDGE CRANES
ARNOLD HUGHES COMPANY
2765 PENOBSCOT BLDG. DETROIT, MICH.
WOodward 1-1894

WANTED
NEW **SURPLUS STEEL** USED
Structurals, Plate, Pipe and Tubing
Consumers Steel & Supply Co.
P. O. Box 270, RACINE, WISCONSIN

WANTED
Used Complete 100 pound Steel capacity motor generator type Induction Melting Furnace. Please contact R.D.V.
Niforge Engineered Castings Inc.
677 Beacon Street, Boston 15, Mass.

WEISS STEEL CO. INC.
600 WEST JACKSON BLVD.
CHICAGO 6, ILLINOIS
Buyers of Surplus Steel Inventories
38 Years of Steel Service

WANTED
SURPLUS STEEL
WALLACK BROTHERS
7400 S. Damen Ave. Chicago 36, Illinois

Try the
WANTED SECTION
for "Hard-to-Find"
Materials or Equipment

WANTED
Upright Bradley Hammers of all types, 50# to 500#.
DONAHUE STEEL PRODUCTS CO.
1919 W. 74th St. Chicago 36, Ill.

EMPLOYMENT EXCHANGE

HELP WANTED

Metallurgical Engineers

With experience in investigation and analysis of mechanical failures, shop methods, processes and devices employed in the manufacture of parts for heavy duty earth-moving equipment; and metallurgical and heat-treating studies to evaluate materials, chemical properties and heat-treating specifications based on analyses of service performance.

ADDRESS BOX G-647
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

MELTOR

NEED MELTOR WITH STAINLESS STEEL BACK GROUND. INDUCTION MELTING FACILITIES 30 TO 2000 LBS CAPACITY

EXCELLENT OPPORTUNITY TO GROW WITH AGGRESSIVE YOUNG COMPANY IN SUBURBAN MILWAUKEE AREA.

ADDRESS BOX G-651
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

POSITION OPEN
Experienced Estimator
Flat Die Forgings
Location: Western Pennsylvania. Enclose a resume of background. Reply is confidential. Immediate placement.
ADDRESS BOX G-650
Care *The Iron Age*, Chestnut & 56th Sts., Phila. 39

STEEL PLANT ENGINEER

A graduate Mechanical Engineer is needed to fill a permanent position in our Plant Engineering Department at Fontana.

This opportunity is available for an outstanding engineer whose experience includes the design, maintenance, construction and layout of rolling mills and steel making facilities.

If your qualifications meet these requirements, send complete resume with salary requirements to

Employment Manager
KAISER STEEL CORP.
P. O. Box 217
Fontana, California

EMPLOYMENT EXCHANGE
The meeting place for employers and men qualified for positions in the metalworking industry.

EMPLOYMENT SERVICE

HIGH GRADE MEN — Salaries $5,000 to $25,000. Since 1915 thousands of Manufacturing Executives, Engineers, Sales Managers, Comptrollers, Accountants, and other men of equal calibre have used successfully our confidential service in presenting their qualifications to employers. We handle all negotiations. Submit record with inquiry. The National Business Bourse, 20 W. Jackson Blvd., Chicago 4.

SITUATION WANTED

METALLURGICAL TRAINEE with eight months' experience in Stainless Steel plant, age 28, wants to acquire thorough practical training in open hearth or electric steel melting in steel mill or steel foundry. Seriously interested in steel making. Strong and healthy. Compensation secondary. Location anywhere. Military status: Reserve. Address Box G-644, Care *The Iron Age*, Chestnut & 56th Sts., Philadelphia 39.

I Saw It In
The **IRON AGE**
A common phrase in the metalworking industry. Let the industry say it about your product.

ADVERTISERS IN THIS ISSUE

An asterisk beside the name of advertiser indicates that a booklet, or other information, is offered in the advertisement. Write to the manufacturer for your copies today.

A

Accurate Steel Rule Die Manufacturers 10
Acme-Newport Steel Co. 137
Adelphia Equipment Co. 204
Aetna-Standard Engineering Co., The 141
*Alco Products Inc. 167
Alcott Calculator Company 199
*Allegheny Ludlum Steel Corp. 169
*Allen-Bradley Co. ..... 19 & 20
Alliance Machine Co., The 73
*Allis-Chalmers Mfg. Co. 78
Aluminium Limited Sales, Inc. 74
American Air Compressor Corp. 203
American Brass Co., The 146
American Bridge, Division United States Steel Corp. 69
American Steel Foundries, King Machine Tool Division Back Cover
American Zinc, Lead & Smelting Co. 120
Arcair Company 176
*Armco Steel Corp. 6
Armel, James P., Co. 206
*Armstrong Bros. Tool Co. 209

B

Baker, J. E., Co., The 76
Baldt Anchor, Chain & Forge Div. 207
Basic Incorporated Inside Front Cover
Bearings, Inc. 109
Belyea Co., Inc. 201
Benkart Steel & Supply Co. 201
Bennett Machinery Co. 201
Berkman, Louis Co., The 205
Bertsch & Company 199
*Bethlehem Steel Co. 1
*Bliss & Laughlin, Inc. 39
*Boston Gear Works 92
Boston Metals Company, The 203
Boynton, A. J., & Co. 209
*Brainard Steel, Div. Sharon Steel Corp. 64
Brownell, Hazard, Machine Tools, Inc. 203
Browning, Victor R., & Co., Inc. 209
Burg Manufacturing Company 14 & 15

C

*Cambridge Wire Cloth Company, The 140
Carco Industries, Inc. 206
Carpenter Steel Co., The 43
*Chambersburg Engineering Co. 24
Cincinnati Gear Company, The 174
*Clark, Robert H., Company 199
*Cleveland Punch & Shear Works Co., The 65
Colorado Fuel & Iron Corp., The Wickwire Spencer Steel Div. 166
Consolidated Railway Equipment Co. 206
Consumers Steel & Supply Company 208
Copper & Brass Research Association 104
*Copperweld Steel Company, Steel Division 142
Crawford, F. H., & Co., Inc. 203
Crucible Steel Co. of America 48 & 61
Curry, Albert, & Co., Inc. 202

D

Davis Keyseater Co. 209
*Dempster Brothers, Inc. 157
Detroit Steel Corp. 113
Donahue Steel Products Co. 201 & 208
Dony, D. E., Machinery Co. 203
*Dravo Corporation 185
Dreis & Krump Mfg. Co. 13

E

Eastern Machinery Co., The 202
Eastern Stainless Steel Corporation ..... 34 & 35
*Electric Furnace Company 154
Electro-Alloys Division, American Brake Shoe Co. 70
Electro Metallurgical Co., Div. of Union Carbide Corp. 51
Enthrone Incorporated 66
Erie Forge & Steel Corporation .. 72
Ex-Cell-O Corporation 96
*Exide Industrial Division, The Electric Storage Battery Co. 53

F

Falk Machinery Co. 201
Federal Products Corp. 67
Fellows Gear Shaper Co., The 60
*Ferry Cap & Set Screw Co., The 210
Finkl, A., & Sons Co. 63
Foster, L. B., Company 206
Frank, M. K. 206

G

Gardner Industrial Foundation ... 148
Gardner Machine Co. 29
Gem Clay Forming Co., The 207
General Electric Co., Apparatus Dept. ..... 36 & 37
*Gleason Works 147
Goodman Electric Machine Co. .. 204
Goodyear Tire & Rubber Co., Industrial Products Div. 8
Goss & DeLeeuw Machine Co. ... 209
Green River Steel Corporation, A Subsidiary of Jessop Steel Company 153
Greist Manufacturing Co., The .. 207
Gulf Oil Corp. ..... 40 & 41

H

Hardinge Mfg. Co. 207
*Harrington & King Perforating Co., The 174
Harvey Aluminum Sales, Inc. ... 38
Henry, A. T., & Company, Inc. 201
*Herr Equipment Corporation, The 177
Hewitt-Robins 157
Holcroft & Company 16
*Homestead Valve Manufacturing Co. 57
Huebel Mfg. Co., Inc. 207
Hughes, Arnold, Co. ..... 206 & 208
Hyman, Joseph, & Sons 203

I

*Ingersoll Milling Machine Company, The Cutter Division 50
Ingersoll Steel Division Borg-Warner Corporation 156
*Inland Steel Co. ..... 54 & 55
*International Nickel Co., Inc., The 62
Iron & Steel Products, Inc. 200

J

*Jones & Laughlin Steel Corporation 12

K

Kaiser Engineers 114
Kaiser Steel Corp. 208
Kardong Brothers, Inc. 209
Keokuk Electro-Metals Co. 155
Keystone Forging Co. 207
*Keystone Steel & Wire Co. 145

ARMSTRONG T-SLOT CLAMPS

Make rigid set-ups in minutes on planers, drill presses, milling machines or other T-slotted beds or platens. Clamp slides or rotates to position on anchoring T-slot bolt. Drop forged, heat-treated body. Heat-treated screw has V-slotted swivel cap.

Write for Bulletin SUT

ARMSTRONG BROS. TOOL CO.
"The Tool Holder People"
5209 Armstrong Ave., Chicago 30, U.S.A.

A. J. BOYNTON AND CO.
CONSULTING ENGINEERS
109 N. Wabash Ave., Chicago 2, Ill.

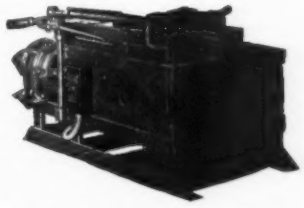
GOSS and DE LEEUW
MULTIPLE SPINDLE
CHUCKING MACHINES
Four, Five, Six, Eight Spindles • Work and Tool Rotating Type
GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN.

"DAVIS" KEYSEATER
Low in Cost. Durable. Easy to operate.
Table adjustable for straight or taper keyways.
Three sizes. Keyways 1/16" up to 1".
DAVIS KEYSEATER CO.
400 Exchange St., Rochester 8, N. Y.

BROWNING ELECTRIC TRAVELING CRANES AND HOISTS
up to 125-TON CAPACITY
VICTOR R. BROWNING & CO., INC. WILLOUGHBY (Cleveland), OHIO

KARDONG CIRCLE BENDER
For Concrete Reinforcing Bars

This is a powerful and fast machine for heavy duty work in both fabricating plants or in the field where large tonnage is required. It will handle as high as 20 tons a day. Circles of any size required in concrete reinforcing work from 18 inches in diameter up can be bent on this machine. It will bend bars with two or more radius on the same bar without stopping the machine.



Made in two sizes.
Model "C" Capacity 1¼ inch
Model "CA" Capacity 1 inch
Write for catalog of our complete line of reinforcing bar benders.

KARDONG BROTHERS, INC.
MINNEAPOLIS 13, MINN.

If It's Action Your After . . .

Advertise it in The Iron Age. Those who make the buying decisions in metalworking watch The Iron Age advertising pages closely.

MUNDT

PERFORATED METALS

The few perforations illustrated are indicative of the wide variety of our line—we can *perforate almost any size perforation in any kind of metal or material required.* Send us your specifications.

Sixty-seven years of manufacturing perforated metals for every conceivable purpose assure satisfaction.

Write for New Catalog of Patterns

TIN, STEEL, COPPER, ALUMINUM, BRONZE
BRASS, ZINC, ANY METAL, ANY PURPOSE

CHARLES MUNDT & SONS
80 FAIRMOUNT AVE. JERSEY CITY, N. J.

WRENCHES TIGHTER
WRENCHES FASTER

The **FERRY CAP**
countr-bor®
SCREW

The externally wrenched screw for socket head screw applications.

Samples, prices, complete information upon request.

THE FERRY CAP & SET SCREW CO. 2157 Scranton Road, Cleveland 13, Ohio

ADVERTISERS IN THIS ISSUE

L

Lafayette Steel Co. ... 204
*Lamson & Sessions Co., The ... 99
Long Machinery Co., Inc. ... 204
*Lanham Skid Co., The ... 173
*La Salle Steel Co. ... 118
Levinson Steel Co., The ... 31
*Linde Co., Div. of Union Carbide Corp. ... 32 & 33
*Lodge & Shipley Co., The ... 119
Luria Bros., & Co., Inc. ... 187 & 203

M

M.E.T. Equipment & Construction Co. ... 206
McLouth Steel Corp. ... 25
MacCabe, T. B. Co. ... 201 & 203
*Mahon, R. C. Co., The ... 151
Marshall Railway Equip. Corp. ... 206
Master Electric Co., The ... Inside Back Cover
*May-Fran Engineering, Inc. ... 170 & 171
Merrill Brothers ... 207
*Metal Carbides Corp. ... 26
Michigan Steel Tube Products Co. ... 117
Miles Machinery Co. ... 203
*Miller Electric Mfg. Co., Inc. ... 116
*Minnesota Mining & Manufacturing Co. ... 162
*Mundt, Chas., & Sons ... 210

N

National Automatic Tool Co. ... 44 & 45
National Business Bourse, The ... 208
National Machinery Exchange ... 202
National-Standard Co. ... 77
New England Pressed Steel Co. ... 208
New Jersey Zinc Co., The ... 100
*Niagara Blower Co. ... 138
*Niagara Machine & Tool Works ... 46 & 47
Nicholson File Co. ... 52
Niforge Engineered Castings, Inc. ... 208
Noble Company ... 42

O

Ohio Steel Foundry Co. ... 110
*Olsen, Tinius Testing Machine Co. ... 175
Olson Manufacturing Co. ... 207
Orban Kurt Co., Inc. ... 183
Ornitz Equipment Corp. ... 206
*Osborn Mfg. Co., The, Brush Division ... 5

P

*Pennsylvania Flexible Metallic Tubing Company, Inc. ... 11
Peterson Steels, Inc. ... 149
*Pittsburgh Engineering & Machine Co. ... 4
*Potter & Johnston, Subsidiary of Pratt & Whitney Co., Inc. ... 163
Power Equipment Co. ... 202
*Pratt & Whitney Co., Incorporated ... 159, 160, 161, 164 & 165
Purdy Company, The ... 206

R

Rail & Industrial Equip. Co., Inc. ... 206
*Reading Crane & Hoist Corp. ... 148
Reliance Electric & Engineering Co. ... 75
*Republic Steel Corp. ... 58 & 59
Revere Copper & Brass, Inc. ... 91
*Reynolds Metals Co. ... 30
*Rhode Island Tool Co. ... 197
Roebling's John A., Sons Corp. ... 17
Rosedale Foundry & Machine Co. ... 207
*Rotor Tool Company ... 56
*Ruthman Machinery Co., The ... 173
Ryerson, Jos. T., & Son, Inc. ... 178

S

Salem-Brosius, Inc. ... 49
Seaboard Engineering Co. ... 204
Seaboard Steel Co., Inc. ... 202
Seymour Manufacturing Co., The ... 189
Simonds Gear & Manufacturing Co., The ... 112
Singleton Machine & Tool Co. ... 204
Smith, Thomas, Co. ... 206
Socony Mobil Oil Co., Inc. ... 22 & 23
*Somers Brass Co., Inc. ... 9
*Speed-D-Burr Corporation ... 199
Stamco, Inc. ... 71
*Standard Pressed Steel Co. ... 28
Standard Tube Sales Corp. ... 207
Stanhope, R. C., Inc. ... 202
Steel & Tube Div., Timken Roller Bearing Co. ... 80
Stevens, Frederic B., Inc. ... 139
*Stone Machinery Company, Inc. ... 106

T

*Tape-Master, A Division of Sod-Master Corporation ... 115
Texas Company, The ... 102
*Thomas Machine Manufacturing Co. ... 18
*Timken Roller Bearing Co., The Steel & Tube Division ... 80
Torrington Co. ... 181
Tractor & Equipment Co. ... 202

U

Union Carbide Corp., Electro Metallurgical Division ... 51
Union Carbide Corp., Linde Division ... 32 & 33
United Engineering & Foundry Co. ... 27
United States Steel Corp. ... 69
United States Steel Export Co. ... 69
Universal Machinery & Equipment Co. ... 202

V

*Vanadium Corp. of America ... 68
Vento Steel Products Co., Inc. ... 204

W

*Wales-Strippit Co. ... 94
Wallack Bros. ... 208
Wallingford Steel Co., The ... 172
Ward Steel Co. ... 176
Weatherly Foundry & Mfg. Co. ... 207
Weiss Steel Co., Inc. ... 208
Wheland Co., The ... 176
Whisler Equipment Co. ... 206
Wicaco Machine Corp. ... 207
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp. ... 166
Wilcox Forging Corp. ... 206
Williams Machinery Co. ... 202
Wilson, K. R., Inc. ... 150
Wyckoff Steel Co. ... 158

Y

Youngstown Sheet & Tube Co., The ... 21

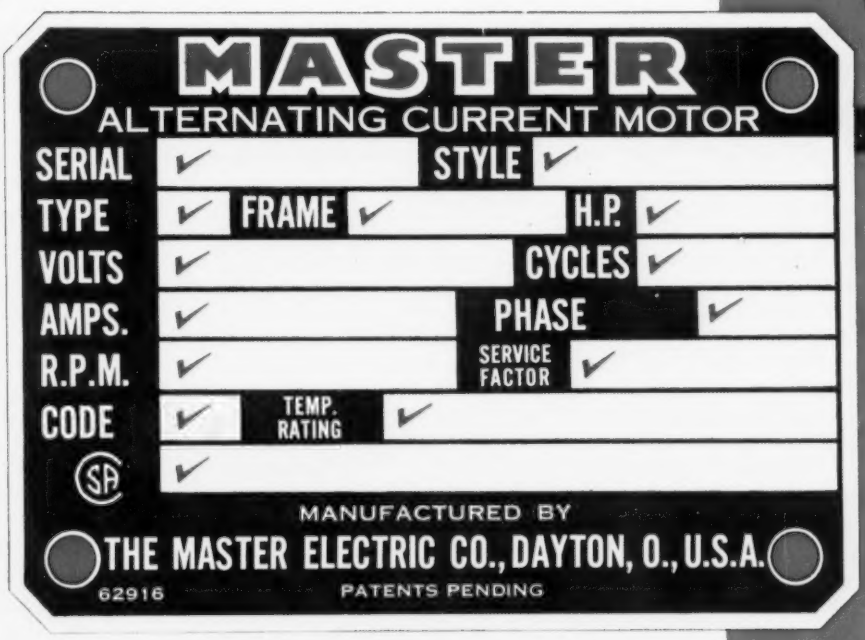
Z

Zak Machine Works, Inc. ... 199

CLASSIFIED SECTION

Clearing House ... 200-206
Contract Manufacturing ... 206-207
Employment Exchange ... 208
Equipment & Materials Wanted ... 208

Write your own ticket—



What are your power drive requirements? Here at Master, with the widest selection in the nation to choose from, you're sure to fill your needs quickest and best.

Need something special in gear reduction—electric brakes—variable speed operation—fluid drive or special mounting? Or would some of our standard models (1/8 to 400 H.P.) fill the bill? You'll find the answer here! And remember, all Master components are engineered to form combinations of units in one streamlined, compact package of efficiency. Name your need and the name that fills it is Master—for greater salability of motor driven products; for increased productivity of plant equipment.

Motor Ratings ..... 1/8 to 400 H.P. All phases, voltages and frequencies.

Motor Types ..... Squirrel cage, slip ring, synchronous, repulsion-start induction, capacitor, direct current.

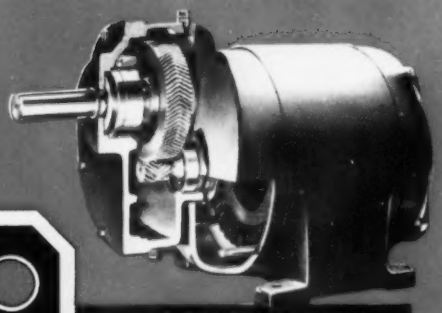
Construction ..... Open, enclosed, splash-proof, fan-cooled, explosion-proof, special purpose.

Speeds ..... Single speed, multi-speed, and variable speed.

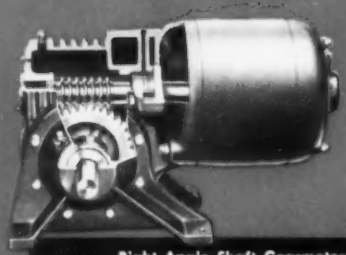
Installation ..... Horizontal or vertical, with or without flanges and other features.

Power Drive Features ..... Electric brakes (2 types)— 5 types of gear reduction up to 432 to 1 ratio. Mechanically and electronically-controlled variable speed units—fluid drives—every type of mounting.

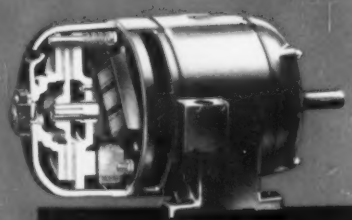
THE MASTER ELECTRIC COMPANY
DAYTON 1, OHIO



Parallel Shaft Gearmotors

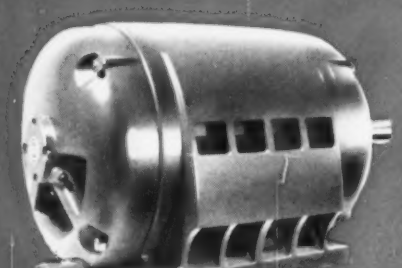


Right-Angle Shaft Gearmotors



Unibrake Motors

Speedrangers



Standard Motors— 1/8 to 400 H.P.

They ALL want to know about the NEW

Electrically Controlled KING

Full Electrically Controlled 36" King with Turret Head, Side Head, and Complete-Unit Coolant Pan. The New Kings are available in sizes 30", 36", 46", 56" and up, in a wide variety of head combinations, with or without side head.

Production Engineers, General Managers, Shop Superintendents, Foremen, and other operating and executive personnel in more and more plants are taking a close, *close* look at the all-new, Full Electrically Controlled King® Vertical Boring and Turning Machine. And they *like* what they find . . . things *you* ought to know, too!

It adds up to this: the new King® will give you a *greatly increased production capacity* for your boring and turning work—a production capacity that is a "must" to meet stiffer competition in these days of continuously stepped-up speed in machine tool operation and control.

For full details on the new King see your King Distributor, or write us direct . . . *now!*

on the ALL-NEW King . . .

- Full Electrical Control—"pushbutton" speed for fast set-up and control.
- Greater Power Reserve—40 and 50 HP on 30", 36" and 46" sizes; 75 and 100 HP on sizes 56" and up.
- Expanded Speed and Feed Ranges—pre-selective with direct-reading dials for 24 speeds in any one of three standard ranges, 24 feeds from .0016 to .250 per revolution.
- New Spindle and Spindle Mounting—table stability that establishes a wholly new higher standard for maintained accuracy.
- Optional Equipment for Additional Increase in Productivity—Automatic Cycling . . . Automatic Positioning of Heads . . . Automatic Tracing Control of Heads . . . Power Rail Clamping.

AMERICAN STEEL FOUNDRIES, KING MACHINE TOOL DIVISION
1150 TENNESSEE AVENUE, CINCINNATI 29, OHIO

KING Vertical Boring and Turning Machines